National Organic Program Regulatory Text Livestock Sections Updated to Include October 24, 2008 Proposed Pasture Rule and FOOD Farmers suggested language changes and comments – 12.16.2008

KEY TO DOCUMENT

- NOP proposed changes indicated in underline and ~~strikethrough~~ format.
- FOOD Farmers suggested deletions and additions to NOP's wording indicated by ***bold italics.*** (For example, words that are underlined, with strikethrough, and in bold italics would be text added by NOP but suggested for deletion by FOOD Farmers).

NOTE: Many definitions and sections of the regulation not relevant to the proposed changes have been left out of this compressed version.

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Subpart A—Definitions

Class of animal. A group of livestock that shares a similar stage of life or production.

Crop. Pastures, ~~***sod***~~, cover crops, green manure crops, catch crops, and any plant or part of a plant intended to be marketed as an agricultural product, fed to livestock, or used in the field to manage nutrients and soil fertility.

Dry matter. The amount of a feedstuff remaining after all the free moisture is evaporated out.

Dry matter demand. The expected dry matter intake for a class of animal.

Dry matter intake: Total pounds of all feed, devoid of all moisture, consumed by a class of animals over a given period of time.

Dry lot. A ~~***confined ,***~~***fenced*** area that may be covered with concrete, but that has ***little or*** no vegetative cover.

Feed. Edible materials which are consumed by livestock for their nutritional value. Feed may be concentrates (grains) or roughages (hay, silage, fodder). The term, "feed," encompasses all agricultural commodities, including pasture ingested by livestock for nutritional purposes.

Feed additive. A substance added to feed in micro quantities to fulfill a specific nutritional need; i.e., essential nutrients in the form of amino acids, vitamins, and minerals.

Feedlot. A ~~***confined area***~~ ***drylot*** for the controlled feeding of ~~***ruminants***~~ ***livestock***.

Feed supplement. A combination of feed nutrients added to livestock feed to improve the nutrient balance or performance of the total ration and intended to be:
(1) Diluted with other feeds when fed to livestock;
(2) Offered free choice with other parts of the ration if separately available; or
(3) Further diluted and mixed to produce a complete feed.

Field. An area of land identified as a discrete unit within a production operation.

Forage. Vegetative material in a fresh, dried, or ensiled state (pasture, hay, or silage), which is fed to livestock.

Graze. (1) The consumption of standing ***or residual*** forage by livestock. (2) To put livestock to feed on standing ***or residual*** forage.

Grazing. To graze.

Grazing season. The period of time when pasture is available for grazing, due to natural precipitation or irrigation. Grazing season dates may vary because of mid-summer heat / humidity, significant precipitation events, floods, hurricanes, droughts or winter weather events. Grazing season may be extended by the grazing of residual pasture as agreed in the operation's organic systems plan. Due to weather, season, and/or climate, the grazing

season may or may not be continuous. Grazing season may range from 121 days to 365 days.

~~The period of time between the average date of the last killing frost in the spring to the average date of the first killing frost in the fall or early winter in the local area of production. This represents a temperature threshold of 28 degrees Fahrenheit (3.9 degrees Celsius) or lower at a frequency of 5 years in 10. Growing season may range from 121 days to 365 days.~~

Inclement weather. Weather that is violent, or characterized by temperatures (high or low), ***or excessive precipitation*** that can ***~~kill or~~*** cause ***~~permanent~~*** physical harm to a given species of livestock. ***Production yields or growth rates of livestock lower than the maximum achievable do not qualify as physical harm.***

~~Killing frost. A frost that takes place at temperatures between 25 degrees and 28 degrees Fahrenheit (2.2 and -3.9 degrees Celsius) for a period sufficiently severe to end the growing season or delay its beginning.~~

Livestock. Any ***~~bee,~~*** cattle, sheep, goat, swine, poultry, or equine animals used for food or in the production of food, fiber, ***~~or~~*** feed, or other agricultural-based consumer products; ***~~fish used for food;~~*** wild or domesticated game; or other nonplant life, ~~except such term shall not include aquatic animals or bees for the production of food, fiber, feed, or other agricultural-based consumer products.~~

Pasture. Land used for livestock grazing that is managed to provide feed value and maintain or improve soil, water, and vegetative resources.

Residual forage. Standing forage or forage cut and left to lie in place in the pasture.

Sacrificial pasture. A pasture or pastures within the pasture system, of sufficient size to accommodate all animals in the herd without crowding, where animals are kept for short periods during saturated soil conditions to confine pasture damage to an area where potential environmental impacts can be controlled; ***or where animals are kept in the non-grazing season to provide access to the outdoors.*** This pasture is then deferred from grazing until it has been restored through active pasture management. Sacrificial pastures are located where soils have good trafficability, are well-drained, have low risk of soil erosion, have low or no potential of manure runoff, are surrounded-by vegetated areas, and are easily restored. ***~~A sacrificial pasture is land used for livestock grazing that is managed to provide feed value and maintain or improve soil, water, and vegetative resources;~~*** It is not a dry lot or feedlot.

Shelter. Structures such as barns, sheds, or windbreaks, or natural areas such as woods, tree lines, or geographic land features that provide physical protection and / or housing to animals.

Stage of life. A discrete time period in an animal's life which requires specific management practices different than during other periods; such as: calves, chicks, etc.

Temporary and Temporarily. Occurring for a limited time only (e.g., overnight, throughout a storm, during a period of illness, the period of time specified by the Administrator when granting a temporary variance), not permanent or lasting.

Yard / feeding pad. An improved area for feeding, exercising, and outdoor access for livestock during the non grazing season and a high traffic area where animals may receive supplemental feeding during the grazing season.

FOOD Farmer comment to NOP: Remove any consideration of origin of livestock from this rule change and work diligently to get a proposed rule on origin of livestock published as soon as possible that will stop the continuous transition of conventional animals as dairy replacements.

§ 205.236 Origin of livestock.

(a) Livestock products that are to be sold, labeled, or represented as organic must be from livestock under continuous

organic management from the last third of gestation or hatching: *Except,* That:

….

(2) *Dairy animals.* Milk or milk products must be from animals that have been under continuous organic management beginning no later than 1 year prior to the production of the milk or milk products that are to be sold, labeled, or represented as organic, *Except,*

(i) That, crops and forage from land, included in the organic system plan of a dairy farm, that is in the third year of organic management may be consumed by the dairy animals of the farm during the 12-month period immediately prior to the sale of organic milk and milk products; and

(ii) That, when an entire, distinct herd is converted to organic production, the producer may, *provided* no milk produced under this subparagraph enters the stream of commerce labeled as organic after June 9, 2007: (a) For the first 9 months of the year, provide a minimum of 80-percent feed that is either organic or raised from land included in the organic system plan and managed in compliance with organic crop requirements; and (b) Provide feed in compliance with §205.237 for the final 3 months.

FOOD Farmer comment: do not adopt changes in (iii) below.

(iii) Once ~~an entire, distinct herd~~ an operation has been ~~converted to~~ certified for organic production using the exception in paragraph (a)(2)(i) or (ii) of this section all dairy animals brought onto the operation shall be under organic management from the last third of gestation.

§ 205.237 Livestock feed.

(a) The producer of an organic livestock operation must provide livestock with a total feed ration composed of agricultural products, including pasture and forage, that are organically produced by operations certified to the NOP, except as provided in § 205.236(a)(i), and, if applicable, organically handled by operations certified to the NOP: *Except*, That, ~~nonsynthetic substances and~~ synthetic substances allowed under §205.603 and nonsynthetic substances may be used as feed additives and supplements, *Provided*, That, all agricultural ingredients in such additives and supplements shall have been produced and handled organically.

(b) The producer of an organic operation must not:

(1) Use animal drugs, including hormones, to promote growth;

(2) Provide feed supplements or additives in amounts above those needed for adequate nutrition and health maintenance for the species at its specific stage of life;

(3) Feed plastic pellets for roughage;

(4) Feed formulas containing urea or manure;

(5) Feed mammalian or poultry slaughter by-products to mammals or poultry; ~~or~~

(6) Use feed, feed additives, and feed supplements in violation of the Federal Food, Drug, and Cosmetic Act;

(7) Provide feed or forage to which anyone, at anytime, has added an antibiotic; or

(8) Prevent ***~~withhold, restrain, or otherwise restrict~~*** ruminant animals from actively obtaining feed grazed from pasture during the ***~~growing~~ grazing*** season, except for conditions as described under § 205.239(c).

(c) During the ***~~growing~~ grazing*** season, producers shall provide not more than an average of 70 percent of a ruminant's dry matter demand from dry matter fed (dry matter fed does not include dry matter grazed from ***residual forage or*** vegetation rooted in pasture). ***This shall be calculated as an average over the entire grazing season for each type and***

class of animal. The grazing season must be not less than 120 days per year. Due to weather, season, and/ or climate, the grazing season may or may not be continuous.

(1) Except that, ruminant slaughter stock that are typically grain finished may be exempt from the 30% pasture DMI requirement during the finishing period, not to exceed 120 days, but must not be denied access to pasture during that period; and that breeding bulls may be exempt from the 30% pasture DMI and pasture access, but if denied pasture access cannot be considered organic slaughter stock.
(2) Grazing season must be described in the operation's organic system plan and be approved by the certifier as being representative of the typical grazing season duration for the particular area. Certifiers, in reviewing the organic system plan, shall confirm that adequate fields are set aside for pasture to provide grazing for ruminants for the entire grazing season, showing intent to maximize grazing beyond the 120 day minimum. Irrigation must be used as needed to promote pasture growth when an operation has it available for use on crops.
(3) In areas where irrigation is not available, certifiers may grant a temporary variance from the 120 days/30% DMI regulation, due to damage caused by atypical drought, flooding, excessive rainfall, or fire, that is experienced during the normal grazing season. Variances are good for a single grazing system and a producer will only be granted a total of three over a ten year period.

~~Producers shall, once a month, on a monthly basis:~~

(d) Producers shall:
(1) Describe the total feed ration for each type and class of animal;
(2) Document changes that are made to all rations throughout the year in response to seasonal grazing changes;
(3) Provide the method for calculating dry matter demand and dry matter intake to certifier for approval.

~~(1) Document each feed ration (i.e., for each type of animal, each class of animal's intended daily diet showing all ingredients, daily pounds of each ingredient per animal, each ingredient's percentage of the total ration, the dry matter percentage for each ingredient, and the dry matter pounds for each ingredient);~~
~~(2) Document the daily dry matter demand of each class of animal using the formula: Average Weight/Animal (lbs) × .03 = lbs DM/Head/Day × Number of Animals = Total DM Demand in lbs/Day;~~
~~(3) Document how much dry matter is fed daily to each class of animal in all rations; and~~
~~(4) Document the percentage of dry matter fed in all rations daily to each class of animal using the formula: (DM Fed ÷ DM Demand in lbs/day) × 100 = % DM Fed.~~.

§ 205.238 Livestock health care practice standard.

(a) The producer must establish and maintain preventive livestock health care practices, including:
(1) Selection of species and types of livestock with regard to suitability for site-specific conditions and resistance to prevalent diseases and parasites;
(2) Provision of a feed ration sufficient to meet nutritional requirements, including vitamins, minerals, protein and/or amino acids, fatty acids, energy sources, and fiber (ruminants);
(3) Establishment of appropriate housing, pasture conditions, and sanitation practices to minimize the occurrence and spread of diseases and parasites;
(4) Provision of conditions which allow for exercise, freedom of movement, and reduction of stress appropriate to the species;

(5) Performance of physical alterations as needed to promote the animal's welfare and in a manner that minimizes pain and stress; and

(6) Administration of vaccines and other veterinary biologics.

(b) When preventive practices and veterinary biologics are inadequate to prevent sickness, a producer may administer ***nonsynthetic substances provided they are not prohibited under 205.604. In addition a producer may administer*** synthetic medications: *Provided,* That, such medications are allowed under §205.603….

§ 205.239 Livestock living conditions.

(a) The producer of an organic livestock operation must establish and maintain year-round livestock living conditions which accommodate the health and natural behavior of animals, including those listed in paragraphs (a)(1) through (a)(***3*** ***4***) of this section. ***Further, producers shall not prevent, withhold, restrain, or otherwise restrict animals from being outdoors, except as otherwise provided in paragraph (b) and (c) of this section.*** Producers shall also provide:

(1) Year-round access for all animals to the outdoors, shade, shelter, exercise areas, fresh air, ***clean*** water for drinking ***(indoors and outdoors),*** and direct sunlight suitable to the species, its stage of life production, the climate, and the environment***, except as otherwise provided in paragraph (b) of this section. Continuous, total confinement in dry lots and feedlots is prohibited.***

(2) Access to pasture for ruminants;

(2) For all ruminants, ***provision of pasture throughout the grazing season to meet the requirements of 205.237 continuous year-round management on pasture***, except as otherwise provided in paragraph (c) of this section***. , for: (i) Grazing throughout the growing season; and***

(ii) Access to the outdoors throughout the year, including during the non-growing season. Dry lots and feedlots are prohibited.

(3) Appropriate clean, dry bedding. If the bedding is typically consumed by the animal species, When ***hay, straw, ground cobs, corn stalks, or other*** crop matter typically fed to the animal species is used as bedding, it must comply with the feed requirements of §205.237. ***Genetically modified crop matter must not be used as bedding;***

(4) Shelter***, as needed and appropriate to the species***, designed to allow for:

(i) Natural maintenance, comfort behaviors, and opportunity to exercise;

(ii) Temperature level, ventilation, and air circulation suitable to the species; and

(iii) Reduction of potential for livestock injury;

(5) Yards***, feeding pads,*** and ***passageways laneways*** kept in good condition and well-drained;

(b) The producer of an organic livestock operation may ***provide temporary confinement*** provide temporary confinement for an animal ***temporarily deny a non-ruminant animal access to the outdoors*** ***and shelter for an animal*** because of:

(1) Inclement weather ***and conditions caused by inclement weather;***

(2) The animal's stage of production life. ***Lactation is not a stage of life that would exempt ruminants from any of the mandates set forth in this regulation;***

(3) Conditions under which the health, safety, or well being of the animal could be jeopardized; or

(4) Risk to soil or water quality.

(c) The producer of an organic livestock operation may temporarily deny a ruminant animal pasture ***or outdoor access*** under the following conditions:

(1) When the animal is segregated ***for the day of breeding or preventive health care practice, or for the*** treatment of illness or injury (the various life

stages, such as lactation, are not an illness or injury);

(2) One ***week at the end of a lactation for dry off, three*** week***s*** prior to parturition (birthing), parturition, and up to one week after parturition;

(3) In the case of newborns for up to six months, after which they must be on pasture ***during the grazing season*** and may no longer be individually housed;

(4) In the case of goats, during periods of inclement weather;

(***5 4***) ***In the case of sheep, f F***or short periods for shearing; and

(***6 5***) In the case of dairy animals, for short periods daily for milking. Milking must be scheduled in a manner to ensure sufficient grazing time to provide each animal with an average dry matter intake from grazing of not less than 30 percent throughout the ***growing*** ***grazing*** season. Milking frequencies or duration practices cannot be used to deny dairy animals pasture.

(d) Ruminants must be provided with:

(1) A lying area with well-maintained clean, dry bedding, which complies with paragraph (a)(3) of this section, during periods of temporary housing, provided due to temporary denial of pasture during conditions listed in paragraphs (c)(1) through (c)(5) of this section and during the non grazing season;

(2) Yards and passageways kept in good condition and well-drained;

(3) Shade and in the case of goats, shelter open on at least one side;

(4) Water at all times except during short periods for milking or sheering - such water must be protected from fouling;

(***5) Feeding and watering equipment that are designed, constructed, and placed to protect from fouling - such equipment must be cleaned weekly; and***

(6) In the case of newborns, hay in a rack off the ground, beginning 7 days after birth, unless on pasture, and pasture for grazing in compliance with § 205.240(a) not later than six months after birth.

~~(c)~~ (e) (d) The producer of an organic livestock operation must manage manure in a manner that does not contribute to contamination of crops, soil, or water by plant nutrients, heavy metals, or pathogenic organisms and optimizes recycling of nutrients***; and (f) The producer of an organic livestock operation*** must manage outdoor access areas, including pastures, in a manner that does not put soil or water quality at risk. ***This may includes the use of fences and buffer zones to prevent ruminants and their waste products from entering ponds, streams, and other bodies of water. Buffer zone size shall be extensive enough, in full consideration of the physical features of the site, to prevent the waste products of ruminants from entering ponds, streams, and other bodies of water.***

FOOD Farmers comment: Put the below practice standards that have been struck out, plus other potential standards, into guidance.

§205.240 Pasture practice standard.

The producer of an organic livestock operation must, for all ruminant livestock on the operation, demonstrate through auditable records in the organic system plan, a functioning management plan for pasture that meets all requirements of §§ 205.200 - 205.240.

(a) Pasture must be managed as a crop in full compliance with §§ 205.200 through 205.206.

(b) ***The producer must develop and annually update a comprehensive*** ***A*** pasture plan ***for inclusion*** ***containing at least the following information must be included*** in the producer's organic system plan, ***which may consist of the***

certifier's farm and livestock questionnaires, and be updated annually when any changes are made. The pasture plan must show the following:
~~When there is no change to the previous year's comprehensive pasture plan the certified operation may resubmit the previous year's comprehensive pasture plan.~~
~~(c) The comprehensive pasture plan must include a detailed description of:~~
(1) The types of pasture provided to ensure that the feed requirements of 205.237 are being met; ~~Crops to be grown in the pasture and haymaking system;~~
(2) Cultural ***and management*** practices ***~~, including but not limited to varying the crops and their maturity dates in the pasture system,~~*** to be used to ensure pasture of a sufficient quality and quantity is available to graze throughout the ***~~growing~~ grazing*** season and to provide all ruminants***, except for exempted classes,*** under the organic systems plan with an average of not less than 30 percent of their dry matter intake from grazing throughout the ***~~growing~~ grazing*** season;
(3)Description of the grazing season.
~~The haymaking system~~
(4) The location of pastures ***~~and haymaking fields~~***, including maps ***~~showing the pasture and haymaking system and~~*** giving each field its own identity;
(5) The types of grazing methods to be used in the pasture system;
(6) The location and types of fences, ***except for temporary fences,*** and the location and source of shade and water;
(7) The soil fertility, seeding, and crop rotation systems.
~~(8) The pest, weed, and disease control practices;~~
~~(9) The erosion control and protection of natural wetlands, riparian areas, and soil and water quality practices;~~
~~(10) Pasture and soil sustainability practices; and~~
~~(11) Restoration of pastures practices.~~

(***c ~~d~~***) The pasture system ***~~must~~ may*** include a sacrificial pasture for grazing, to protect the other pastures from excessive damage during periods when saturated soil conditions render the pasture(s) too wet for animals to graze; ***and for outdoor access in the non-grazing season***. ***~~The sacrificial pasture must be:~~***
~~(1) Sufficient in size to accommodate all animals in the herd without crowding;~~
~~(2) Located where:~~
~~(i) Soils have good trafficability;~~
~~(ii) Well-drained;~~
~~(iii) There is a low risk of soil erosion;~~
~~(iv) There is low or no potential of manure runoff;~~
~~(v) Surrounded by vegetated areas; and~~
~~(vi) Easily restored.~~
~~(3) Managed to:~~
~~(i) Provide feed value; and~~
~~(ii) Maintain or improve soil, water, and vegetative resources.~~
~~(4) Restored through active pasture management.~~

(e) In addition to the above, producers must manage pasture to comply with all applicable requirements of §§ 205.236 - 205.239.

FOOD Farmers comment: Add the following pasture practice standard to guidance:
At no time during the grazing season, when any class of ruminant receives less than 30% of their dry matter intake from grazing, except for exempted classes, shall the operation mechanically harvest crops from its pastures, showing intent to maximize grazing over other feeding systems throughout the grazing season.

Detailed comments on suggested language changes

Definitions

1. We recommend including a definition for **Class of Animal** to meet the requirements of calculating different levels of feed consumption for livestock of different ages or production.

Suggested wording: **Class of animal: A group of livestock that shares a similar stage of life or production:**

2. Crop.

We welcome the inclusion of pastures, cover crops, green manure crops and catch crops to ensure that these are seen as crop and are therefore subject to the requirements of §205.204. We suggest the removal of sod as we are concerned about the extension of scope of certification to sod farms, which involve removing soil, crop, and organic matter in methods that are likely not sustainable and for which there are no standards/guidance in place. Sod is a landscape material and does not fit within this rule as livestock do not eat sod.

Suggested wording: **Pastures, cover crops, green manure crops, catch crops, and any plant or part of a plant intended to be marketed as an agricultural product, fed to livestock, or used in the field to manage nutrients and soil fertility.**

3. We recommend the inclusion of these definitions for dry matter and dry matter intake to assist with the calculation of dry matter fed and ensure that calculations are consistently applied to all livestock operations.

Suggested wording: **Dry matter demand: The expected dry matter intake for a class of animal**
Dry matter intake: Total pounds of all feed, devoid of all moisture, consumed by a class of animals over a given period of time.

4. Dry lot.

We welcome the definition of dry lot based on the industry's use of the term. We suggest that "confined" be replaced by "fenced" to illustrate that the definition refers to a traditional feed lot that is a risk to the environment and the health of the livestock. We suggest the addition of the "little or" to "no" vegetative cover to avoid the manipulation of the language when there are small amounts of vegetation available at certain time of the year.

Suggested wording**: A fenced area that may be covered with concrete, but that has little or no vegetative cover.**

5. Feedlot.

We welcome the definition of dry lot and suggest that for the sake of clarity and consistency in the use of terms, the words "confined area" be replaced by "drylot" as described above. Also, "livestock" should replace "ruminant" to reflect the fact that livestock other than ruminants could be fed in a feedlot.

Suggested wording: **A drylot for the controlled feeding of livestock**

6. Graze

The definition of graze and grazing is essential for the understanding and implementation of this rule. We suggest that the words "or residual" are added to take into account the common practice of graziers to clip their pasture to increase pasture growth and encourage more vibrant growth from productive vegetation. This also takes into account producers who stockpile forage for the winter by not grazing it during the growing season to have winter forage, or those who have rapid growth during one season and have historically cut and windrowed the grass to graze it in place at a later time to extend their grazing season, encourage the growth of productive grasses and maximize the income for their operation. It is important in any final rule that it is clear that pasture grazing means livestock eating vegetation outside on pasture as it is growing or where it was mowed and let lay- not eating foodstuff that was previously harvested from a pasture.

Suggested wording: **(1) The consumption of standing or residual forage by livestock. (2) To put livestock to feed on standing or residual forage.**

7. Growing season

We suggest that the definition for growing season is deleted and the definition of grazing season is added as that can be better defined to take into account the reality of grazing seasons in different areas. Because of the vast differences in climatic conditions across livestock production areas, the growing season can not merely be defined by last and first frosts. The proposed definition does not account for areas, such as arid or hot climates, where part of the time period between frosts is actually a time of limited or no growth which is not suitable for grazing, or areas that experience intense periods of rain that are unsuitable for grazing because of likely damage to pasture stands and soil and water quality. We suggest that wherever the word "growing" is used in the proposed rule, that the word "grazing" be substituted.

8. Grazing season.

Suggested wording**: Grazing season. The period of time when pasture is available for grazing, due to natural precipitation or irrigation. Grazing season dates may vary because of mid-summer heat / humidity, significant precipitation events, floods, hurricanes, droughts or winter weather events. Grazing season may be extended by the grazing of residual pasture as agreed in the operation's organic systems plan. Due to weather, season, and/or climate, the grazing season may or may not be continuous. Grazing season may range from 121 days to 365 days.**

This definition is written to be applicable across different climatic conditions and includes the aspects of weather that can interrupt or end a grazing season, while defining that grazing season for the purposes of this regulation has a minimum number of days per year. It allows the grazing season to be extended beyond the period of time that plant growth occurs through the grazing of residual vegetation. It is essential that the producer and certifier agree ahead of time what the grazing season is and that it is incorporated within each operation's organic system plan.

Examples of grazing season in various areas are:

Northwest WI: The historical and typical grazing season begins May 1 and lasts until October 15 (5.5 months for our climate). Greg Andrews (University of WI Extension).

Northern Colorado: Typical grazing season is from April 1 to November 1 (7.0 months), but there is little to graze in July and August heat, when continuous irrigation only keeps the predominant cool season perennial pasture plants alive, but not thriving. The typical grazing season is therefore 5.0 months long. Submitted by Arden J. Nelson, DVM of Windsor Dairy, LLC, in Windsor, Colorado.
More examples to add here

9. Inclement weather:
The definition for inclement weather included in the proposed rule was viewed by producers as only dealing with extreme situations that would cause permanent harm or death. Producers have had experience with many weather related situations where the harm to their livestock may not be permanent but can still endanger the welfare or shorten the life of their livestock. Because exact weather conditions and their potential effects cannot be known, producers will have to make the impossible decision of correctly predicting with the proposed definition of inclement weather:

1. Will the wind speed and temperature drop be such over night that cows may suffer frostbite that will cause permanent harm or not?
2. Will a cow slip on that icy patch in the sacrifice pasture and split her legs, damaging her back so that she will never be able to get up again or not?
3. Is the temperature and humidity high enough that a dry cow will suffer heat stroke and abort her calf or not, etc.

Having the bar for inclement weather so high that the trigger is potential animal death or permanent damage is not only anathema to the good animal husbandry practices of producers but also ignores the animal welfare concerns of consumers and citizens. If "kill" and "permanent" are not removed from the definition, it will rightly allow criticism by conventional agriculture and animal welfare advocates. We therefore recommend the deletion of the words "permanent" and "kill" and the addition of the sentence that "loss of production or growth rate do not qualify as physical harm" to not allow abuse of a lower bar definition of inclement weather.

Suggested wording: **Inclement weather**: **Weather that is violent, or characterized by temperatures (high or low), or excessive precipitation that can cause physical harm to a given species of livestock. Production yields or growth rates of livestock lower than the maximum achievable do not qualify as physical harm.**

10. Killing Frost:
We suggest the deletion of the definition of killing frost as it is not necessary with the deletion of growing season.

11. Livestock:
We believe it is premature to add "bee" or "colony of bees" and "fish used for food" and therefore suggest the deletion of the words "bee," and "fish used for food" until such time as a Final Rule is enacted establishing standards for the organic production of such species and systems. The NOSB has adopted recommendations for apiculture and aquatic animals and those

recommendations should serve as the basis for future rule making. It is premature to include "bee" and "fish used for food" in the definition of "livestock," at this time. We would note that the phrase "equine animals used in the production of food, fiber, or feed..." does not mean that non-certified equine animals used for draft purposes are subject to the requirements of this regulation. Such draft equines can be used on organic operations but can be treated as part of a split operation.

Suggested wording: **Livestock: Any cattle, sheep, goat, swine, poultry, or equine animals used for food or in the production of food, fiber, or feed, or other agricultural-based consumer products; wild or domesticated game; or other non-plant life**

12. Residual forage:
We have suggested using the word "residual forage" in the definition of "Graze" and with the use of the word we need to define it. Many operations will employ management practices to maximize the productivity of their pastures which will leave residues for livestock to eat. The most common is clipping pastures to encourage the growth of species which are either more appropriate to the climate or give a higher feed value. Another common management practice in some more arid areas with a short growing season is to cut pasture and leave it in windrows in the pasture to encourage growth of more productive grasses, control weeds and prolong the grazing season. We strongly advocate for allowing the producer to be able to include historical management practices in their organic system plan which take into account the many pasture management practices used by producers in many locations.

Suggested wording: **Residual forage: Standing forage or forage cut and left to lie in place in the pasture.**

13. Sacrificial pasture:
The use of sacrificial pastures is a pasture management technique that aims to increase livestock access to pasture and can be incorporated on some operations that have the proper soil resources, environmental conditions, and access for livestock. Sacrificial pastures, if managed correctly, will encourage longer pasturing of animals and help close loopholes which may allow farmers to unnecessarily keep their animals off pasture due to wet conditions.

We agree with having the definition within the rule so that this is seen as an acceptable practice We also wish to draw the distinction between a sacrificial pasture and a feedlot as there have been cases of non-compliance where a feed lot is called a sacrificial pasture so there is value in having the clear definition with the words restored to "active pasture management."
We suggest adding "***or where animals are kept in the non-grazing season to provide access to the outdoors"*** as a description of its most appropriate use during the non-grazing season.

However, not all operations have soils suitable to be used during wet conditions or they may have pastures usable as sacrificial pasture during the grazing season but do not have safe or possible access during the non-grazing season. We believe that a sacrificial pasture should not be mandatory and agree with the need to define it so long as "may" governs the use and it doesn't become mandatory. We believe that it gives more opportunity for producers to use this as a

management tool if they have the right land and location, increasing the production options for producers.

We suggest the deletion of the sentence "A sacrificial pasture is land used for livestock grazing that is managed to provide feed value and maintain or improve soil, water, and vegetative resources" because a pasture's use as a sacrifice area during wet soil conditions and / or during the non-grazing season no doubt will cause damage to the pasture vegetative and soil resources and feed value in the short term. This damage will then be alleviated when later restored through mechanical and/ or cultural practices.

Suggested wording: **Sacrificial Pasture: A pasture or pastures within the pasture system, of sufficient size to accommodate all animals in the herd without crowding, where animals are kept for short periods during saturated soil conditions to confine pasture damage to an area where potential environmental impacts can be controlled; or where animals are kept in the non-grazing season to provide access to the outdoors. This pasture is then deferred from grazing until it has been restored through active pasture management. Sacrificial pastures are located where soils have good trafficability, are well-drained, have low risk of soil erosion, have low or no potential of manure runoff, are surrounded by vegetated areas, and are easily restored. It is not a dry lot or feedlot.**

14. Shelter:
For clarity of the intention of §205.239(a)(1), we suggest the addition of a definition for a shelter that can be used temporarily during the grazing season and for longer periods of time outside of the grazing season.

Suggested wording: **Structures such as barns, sheds, or windbreaks, or natural areas such as woods, tree lines, or geographic land features that provide physical protection and / or housing to animals**

15. Stage of life.
Stage of life is used within this rule and we suggest the following definition:
A discrete time period in an animal's life which requires specific management practices different than during other periods; such as: calves, chicks, etc.

16. Temporary and Temporarily:
We agree with this definition and welcome the clarity it will bring when using these words.

17. Yard / feeding pad:
We suggest the addition of a definition for an area where livestock can be fed, exercised and be provided with outdoor access during the non-grazing season which will be appropriate for both locations that do not need shelter in the non grazing season and for those locations that do need the use of barns and other shelter. We also recognize that livestock may need supplemental feeding during the grazing season and this definition for a yard/permanent feeding pad meets all the requirements of good manure handling and land management. The yard/feeding pad will often be the most efficient and environmentally sound way to provide a cost effective way to feed livestock a balanced ration. Barnyards and concrete feeding pads are an important part of

farm operations in the non arid areas, minimizing damage to fields that can happen during wet conditions and high impact activities like feeding. In arid areas, the concrete is not as important, as mud is seldom an issue and the manure dries up quickly after being broken up and dispersed by harrowing the yards. Yards / barnyards are also integral to grazing systems as they serve as the area where lactating animals are gathered and dispersed between the pastures and the milking facility.

For those not familiar with barnyards or feeding pads, here are a few pictures from Twin Oaks Dairy LLC and a description of how these facilities are used. Figure 1 shows some older heifers and dry cows on their feeding pad--a large concrete area that can take the impact of the animals' hoofs and allows for the collection of manure. It is used as the feeding facility for this group of animals in the non-grazing season. The livestock also have free access to a free stall barn, where the water is located, and have access to some sacrifice pasture. Without the feeding pad, the baleage feeders would be on the sacrifice pasture and become an environment hazard. In the grazing season, these animals are on 100% pasture all of the time except when they are brought into the barnyard for sorting out animals that are getting close to calving, etc.

Figure 1: Feeding pad in winter

Figure 2: Feeding pad and shelter in the grazing season

Figure 2 shows the barnyard in use during the grazing season, holding half the cows after the herd has been brought in off pasture for milking, while the other half is being milked in the tie stall barn. In the grazing season, they also have access to hay in the feeder, water, salt and minerals in the barnyard and total mixed ration (TMR) in the freestall barn (how much is fed depends on the amount of pasture available--they often only get about 20% of their normal winter time TMR during May, about 50% in August, and 80% in October). After the first group is milked and the groups are switched, the gate to pasture is opened again. When the second group is finished milking, they will be let out to the barnyard too and then all will be taken to pasture until the next milking.

Suggested wording: **Yard/Feeding pad: An improved area for feeding, exercising, and outdoor access for livestock during the non grazing season and a high traffic area where animals may receive supplemental feeding during the grazing season**

§205.236 Origin of Livestock:

We strongly recommend the removal of any consideration of origin of livestock from this rule change and urge the NOP to work diligently to get a proposed rule on origin of livestock published as soon as possible that will stop the continuous transition of conventional animals as dairy replacements.

We do not agree with the new language proposed by the NOP and do not want it to be implemented. We welcome the opportunity to provide the NOP with comments and suggest the following language: "Once an operation has been certified for organic production, all dairy animals born or brought onto the operation shall be under organic management from the last third of gestation."

This definition would have the following benefits:

1. The standard would meet the requirement of OFPA, would be consistent with the Rule Preamble, would be consistent with the standing NOSB Livestock Committee interpretation, and would be consistent with the public comment received on the topic.
2. The standard would be consistent and fair across the full spectrum of operations, no matter how or when operations transitioned or whether the replacement animals were farm raised or purchased.
3. It will mean that organic dairy animals of all ages will carry a premium price, as should be the case.
4. Requiring that all replacement dairy animals, both purchased and farm-raised, be fed and managed organically will increase demand for organic feeds.
5. Certified organic dairy producers would have to buy animals that had been under organic management from the last third of gestation, but could not buy any animals that had been transitioned to organic.
6. Organic heifer ranches would have to have brood cows that are managed organically during the last third of gestation (3 months) to supply them with calves or buy calves that are organic from the last third of gestation.
7. If the organic market needs more milk, then it would be filled by:
    a) New dairy operations transitioning to organic production
    b) Existing dairy operations expanding through internal herd growth
    c) The purchase of excess last third of gestation stock from other operations or
    d) Non-organic brood cows that are managed organically during the last third of gestation (3 months) to supply organically certifiable calves.
8. On transitioning dairy operations, the first animals that would qualify for sale as organic dairy cattle replacement stock would be those born 3 months (last third of gestation) after the start of 100% organic feeding and management.
9. Requiring organic management of calves supports a "systems" approach to organic dairy production and requires that nutritionists, veterinarians, and producers improve organic calf rearing practices.

We do not request any exemptions to this rule. Some have advocated for transitioned cows and heifers to be sold as organic. Allowing transitioned animals to be sold as certified organic creates a loophole that will be exploited. Transitioned animals are, technically, not organic. A transitioned animal is certified to produce organic milk, but cannot be sold for organic slaughter, and shouldn't be allowed to be sold as an organic dairy animal. If culled from the herd, a transitioned animal should be sold into the conventional market. There will be no

decrease in the asset value to the producer as the original value of the livestock was as a conventional animal and the producer has recouped any expense incurred in transitioning to organic certification through the premium received for organic milk produced.

Our Suggested language for **§ 205.236 (a) (2) (iii): "Once an operation has been certified for organic production, all dairy animals born or brought onto the operation shall be under organic management from the last third of gestation"**

§ 205.237 Livestock feed.

Nature intended ruminants to spend all their time on pasture. It has been human intervention that contrived the unnatural situation for livestock, especially dairy cows, to be kept off pasture and in artificial, human created environments—breeding animals that excelled in high-production/confinement management and on highly processed stored feedstuffs. Nature would assert that ruminants should certainly be on pasture during the full grazing season, when the environmental conditions allow pasture growth, either with natural precipitation or irrigation if rainfall is inadequate. Most organic producers have pasture systems in place which allow them to continue grazing their livestock for a considerable time period after pasture growth has ceased by stockpiling growth and by having adequate acreage in their systems. 120 days should be established as the shortest amount of grazing days allowable—anything less is just too brief to be considered adequate to provide enough of the natural environment for ruminants.

By requiring ruminants to be on pasture, the animals are in their natural environment where they can walk and lay on soft, cushiony ground; harvest food that provides nutritional factors that are lost with machine harvest; and have access to fresh air, sunlight, and freedom to express natural behaviors. Most organic dairy producers have set up their milking systems in such a way that the cows are milked quickly and efficiently and sent out on fresh pasture after each milking. In situations like these, the cows are on pasture for 18 or more hours a day.

There are dairy operations in this country that rely solely on pasture during the growing season and there are a multitude of farms in New Zealand who do as well, many in New Zealand and other temperate areas of the world, relying on pasture year round to supply 100% of the cow's intake, other than perhaps salt and some minerals. Studies done by Tilak Dihman at Utah State University show that there is a linear relationship between pasture intake and levels of beneficial fatty acids in milk and meat—the more pasture intake, the higher the levels of beneficial fatty acids like CLA and omega 3 (Dhiman, T.R., et al. 1999. "Conjugated Linoleic Acid Content of Milk from Cows Fed Different Diets." *Journal of Dairy Science* 82:2146-2156).

While science suggests that 100% pasture intake would give the consumers the most nutritional benefit and is the most natural instinct and environment of the dairy cow, the consensus among organic dairy producers (NODPA, MODPA, WODPA, CROPP Cooperative, Horizon Organic, HP Hood, Lancaster Organic Farmers Cooperative, Stonyfield Farm, Humboldt Creamery, Michigan Organic Dairy Producers, Organic Choice, DMS Advisory Committee) and the vast majority of the organic community is that 30% dry matter intake should be the very minimum

amount of pasture intake during the grazing season.[1] Most organic dairy producers will supply much more pasture intake than this minimum level.

Like other aspects of the NOP regulations, the 30% figure is not science based. It is the byproduct of a long collaboration between stakeholders in the organic dairy community which resulted in the near consensus of support for the proposed benchmarks and was a compromise from higher proposed DMI levels initially discussed, as is the current practice on most organic farms. The 30% is a number just like all the other numerical parameters in the NOP Rule--a number has to be picked that makes good, practical sense, but may be somewhat arbitrary as are the following regulation numbers:

- Sodium nitrate restricted to no more than 20% of a crop's total nitrogen requirement.
- Compost: C:N ratios between 25:1 and 40:1; temperature to be maintained between 131F and 170F for 3 days for in-vessel or static aerated pile or 15 days for a window system during which the material must be turned a minimum of 5 times.
- 36 months with no prohibited substances for land prior to organic certification
- 90 days milk withhold after use of Ivermectin
- 7 day withholding of milk after use of lidocaine and procaine for dairy animals, 90 day withholding for slaughter stock
- 90-120 days after application of raw manure before harvest of an organic crop
- 95% organic content for "organic " labeling

On August 16, 2005 the NOSB adopted the following language as guidance: The Organic System Plan should have the goal of providing a significant portion of the total feed requirements as grazed feed but not less than 30% dry matter intake on an average daily basis during the growing season but not less than 120 days per year.[2]

§ 205.237(a)

We welcome the proposed changes by the NOP clarifying that all agricultural components of feed additives and supplements must be organic. We welcome and agree with the clarification of existing requirements concerning all feed fed to organic livestock must be organically certified. The inclusion of this language will level the playing field across the country to the benefit of every producer, whether they have 10 or 2,000 cows. We do not support the use of uncertified feed as feed is an essential factor in the production of milk. This will not be a disadvantage to small exempt operations as the cost of certification is now subsidized by federal cost share programs. The inclusion of this provision will guarantee to the consumer that all feed consumed by organically certified livestock is certified by a NOP accredited third party, thus ensuring the integrity of the Organic seal and the future value-added income to small operations. These changes should be included in the Final Rule.

§ 205.237(b) (7)

We support the inclusion of this language which categorically bans antibiotics in any feed or health care products.

[1] See letters from major companies advocating for this position as Attachment A:

[2] See Attachment H: NOSB Livestock Committee Recommendation for Rule Change

§ 205.237(b) (8)
We recommend that the language here be changed and the words ***withhold, restrain, or otherwise restrict*** be removed as being duplicative.

Our suggested wording for **§ 205.237(b) (8)**: **Prevent ruminant animals from actively obtaining feed grazed from pasture during the grazing season, except for conditions as described under § 205.239(c).**

§205.237(c)
We suggest some significant changes to **§205.237(c)** that will take into account the realities of organic livestock production and not create unnecessary recordkeeping for producers. The proposed language **§205.237 (c) 1-4** should be issued as guidance to assist organic ruminant livestock operations in documenting compliance and to help accredited certifying agents assess compliance. Producers should not have the burden of increased recordkeeping because certifiers do not have the experience to certify livestock operations. The certifier should be working with the producer to integrate their existing record keeping system into their organic system plan rather than imposing very narrow parameters for measurement of feed intake that may not be relevant to the producer's operation in order to reduce the burden on the producer and to take into consideration the variety of accepted methods for determining dry matter demand and intake.

We suggest adding "residual forage**"** to 205.237 (c) to match the change in definition of graze and adding "This shall be calculated as an average over the entire grazing season for each type and class of animal. The grazing season must be no less than 120 days per year. Due to weather, season, and/ or climate, the grazing season may or may not be continuous." To provide clear direction and enforceable rule language we strongly advocate for the above clear statement requiring that feed consumption is calculated as an average over the entire grazing season.

Attachment B: "Extending the grazing season" by John Cockerall of the University of Wisconsin gives a clear description of the grazing season and how to extend it.

Our suggested wording for § 205.237(c): **During the grazing season, producers shall provide not more than an average of 70 percent of a ruminant's dry matter demand from dry matter fed (dry matter fed does not include dry matter from residual forage or grazed from vegetation rooted in pasture). This shall be calculated as an average over the entire grazing season for each type and class of animal. The grazing season must be no less than 120 days per year. Due to weather, season, and/ or climate, the grazing season may or may not be continuous.**

§ 205.237(c).1
We suggest adding an exemption from meeting the 30% of dry matter from pasture during the grazing season for organic beef to accommodate the consumer's desire for grain finished meat. This language recognizes the requirements of the market and the producer's need to maximize their profit by receiving top dollar for their meat while not creating a beef finishing lot which the US consumer believes is something that is bad for livestock and the environment. All of the

available data, research and comments to the ANPR have a consistent theme of opposing confining livestock and feedlot feeding. [3] The organic consumer is typically well educated and will be paying top dollar for organic beef that they believed spent its life on pasture. The Organic Consumers Association, under a banner headline "**Tell USDA to Close All Loopholes Allowing Organic Dairy CAFOs!"** supported the following wording **"**NOP rules need to be revised to permit grain finishing of beef slaughter stock, such that these animals may be exempt from the 30% pasture DMI requirement during the finishing period, not to exceed 120 days, but must not be denied access to pasture during that period." If a 90-120 day exemption from pasture is allowed, some organic production systems would be allowed to keep their organic beef confined for the majority of their life of 18-24 months.

Nutritional benefits of products from pasture-raised livestock are also cited in the Addendum. One study found that organic milk was 50% higher in Vitamin E, 75% higher in beta carotene and higher in omega 3 essential fatty acids than conventional milk. This study tied these qualities to organic cows having room to graze and a diet high in fresh grass and clover, and forage and less maize (corn). Intensively pastured cows produced milk with CLA concentrations that were about 3- to 4-fold greater than initial concentrations. Ribeye steaks from cattle finished on a combination of pasture and concentrate were higher in CLA content than steaks from cattle finished on conserved forages plus concentrates.

We also recommend that an exemption be added from the 30% DMI pasture requirement and pasture access for breeding bulls to reflect the reality that it is illegal in some states to put mature bulls on pasture. However, any such bulls denied pasture access (as per the above recommended requirement for beef slaughter stock) would then no longer qualify as certified organic slaughter stock if they had not been fully managed according to all slaughter stock requirements.

Attachment C: "Does Pasture Finished Beef make the Grade" is a 2008 study by University of Wisconsin that has a bottom line assessment that "Through the use of supplementation, it is possible to produce beef on pasture that will meet commodity market specifications. More time is required to meet these specifications when diets are strictly forage based. The cost of the additional dwell time for the forage-based steers is a trade-off with respect to the added cost of supplementation. But supplementation is a way to stretch pasture, especially during a summer slump in pasture growth."

Attachment D: "Sward Characteristics of Beef Finishing Pasture" a 1996 presentation by Jim Gerrish, F. Martz and V. G. Tate which gives the results of eighty-eight steers who were assigned to four grain feeding levels on pasture with each treatment replicated twice. Observed average daily gains (ADG) were consistent with predicted ADG based on forage plus grain intake levels.

Our suggested wording for **§ 205.237(c).1** is**: Except that, ruminant slaughter stock that are typically grain finished may be exempt from the 30% pasture DMI requirement during the finishing period, not to exceed 120 days, but must not be denied access to pasture during that period; and that breeding bulls may be exempt from the 30% pasture DMI and pasture access, but if denied pasture access cannot be considered organic slaughter stock.**

[3] Attachment F: Press Release from Consumers Union and Center for Food Safety, April 2006

§ 205.237(c) (2):
The producer has to meet 30% DMI from pasture for ruminants during the grazing season and they need to identify their particular grazing season based on independent data from research where available, historical data from their own operation and anecdotal knowledge from their neighbors. The producer will need to incorporate the definition of grazing season into their organic system plan and the certifier has the role of approving the grazing season and verifying whether or not the 30% is met. This is not overly prescriptive. The certifier needs to know enough about grazing seasons in the areas in which they certify and be able to judge. The certifier also needs to know enough about livestock nutritional needs and the content of feeds to verify what's being provided through the raised and purchased feed, and the pasture. We recommend that a certifier that can't do that, shouldn't be certifying livestock and that accreditation by NOP take into account the certifier's knowledge of livestock, growing condition and calculating feed values in their accreditation process.

Our suggested language for : **§ 205.237(c) (2) is : Grazing season must be described in the operation's organic system plan and be approved by the certifier as being representative of the typical grazing season duration for the particular area. Certifiers, in reviewing the organic system plan, shall confirm that adequate fields are set aside for pasture to provide grazing for ruminants for the entire grazing season, showing intent to maximize grazing beyond the 120 day minimum. Irrigation must be used as needed to promote pasture growth when an operation has it available for use on crops.**

§ 205.237(c) (3)
There are dairies in locations that have a variable rainfall and are subject to drought on an occasional basis which is difficult to factor into an organic systems plan.[4] There are also years when drought affects areas that usually have adequate rainfall. While producers will be able to predict rainfall and those with irrigation will be able to plan when to irrigate, there will be years when rainfall cannot be predicted at the beginning of the year in the organic systems plan. If the drought conditions become typical rather than atypical, the producer will be required to change their organic systems plan, reduce their stocking rate or incorporate new production management practices.
Our suggested language for : § 205.237(c) (3) is: In areas where irrigation is not available, certifiers may grant a temporary variance from the 120 days/30% DMI regulation, due to damage caused by atypical drought, flooding, excessive rainfall, or fire, that is experienced during the normal grazing season. Variances are good for a single grazing system and a producer will only be granted a total of three over a ten year period.

§ 205.237(d):
The suggested language below will provide sufficient information to the certifier to allow them to assess compliance without excessive or burdensome recordkeeping for the producer. There are many ways to measure dry matter intake and dry matter demand which will vary with different operations and different classes of livestock. This language allows the producer and the certifier to arrive at an acceptable method for year round measurement that fits within their existing management system.

[4] Attachment G: Precipitation graphs for Santa Rosa (CA) from 2005 to 2008

Our suggested language for **§ 205.237(d): Producers shall:**
(1) Describe the total feed ration for each type and class of animal;
(2) Document changes that are made to all rations throughout the year in response to seasonal grazing changes;
(3) Provide the method for calculating dry matter demand and dry matter intake to certifier for approval.
Insert examples here of how this is applied in different areas.

§ 205.238
Livestock health care practice standard. We suggest adding the following language to this section as it is an unfortunate omission in the current language:
§ 205.238 (b): When preventive practices and veterinary biologics are inadequate to prevent sickness, a producer may administer non-synthetic substances provided they are not prohibited under 205.604. In addition a producer may administer synthetic medications: Provided, that, such medications are allowed under §205.603….

§ 205.239 Livestock living conditions.
The proposed changes to this section provided the most challenge to producers as was evident with the many comments at the listening sessions. Year round access to pasture is difficult and / or unworkable for the majority of organic livestock producers.

§ 205.239 (a) (1)
We agree with the need to establish and maintain year round livestock living conditions as described in § 205.239 (a) but recommend striking "**Further, producers shall not prevent, withhold, restrain, or otherwise restrict animals from being outdoors, except as otherwise provided in paragraph (b) and (c) of this section"** as too prescriptive and not recognizing the realities of organic dairy production and management systems where livestock may not have continual access to the outdoors at all hours of the day and night.

In § 205.239 (a)(1) we strongly support year round access for all animals to the outdoors with sufficient shade, shelter and fresh air and water for drinking and the change of "stage of production" to "stage of life." We recommend specifying "clean" water to simplify the regs and alleviate the need to again mention providing water as described in **§ 205.239 (d)(4),** as well as to make "clean" water required for all livestock, and not just for ruminants. We suggest striking "(indoors and outdoors)" where it references providing water for drinking as it is overly prescriptive and burdensome to producers and does not take into account the extreme variations in operational management, layout of the farm operations, and low wintertime temperatures in many areas. In some climates it is physically and economically impossible to provide water at all times outside, or not a common practice to provide it outdoors for species like poultry.

We suggest adding "**except as otherwise provided in paragraph (b) of this section"** to recognize that there are exemptions from the requirement for outdoor access which allow temporary confinement and the providing of shelter**.** We suggest re-phrasing "Dry lots and feedlots are prohibited" to "**Continuous, total confinement in dry lots and feedlots is prohibited"** to acknowledge the fact that it is the practice of total confinement that is being

outlawed, recognizing that some very well managed organic grazing operations do currently supplement feed their livestock in what have been called 'feedlots' during the grazing season or during the non-grazing season. It additionally emphasizes the need for access to pasture and acknowledges the overwhelming support by consumers, producer and processors that organic livestock not be confined to feedlots or drylots.

Our suggested language for **§ 205.239 (a)(1**): **Year-round access for all animals to the outdoors, shade, shelter, exercise areas, fresh air, water for drinking, and direct sunlight suitable to the species, its stage of life, the climate, and the environment, except as otherwise provided in paragraph (b) of this section. Continuous, total confinement in dry lots and feedlots is prohibited.**

§ 205.239 (a) (2)

In § 205.239 (a) (2) we disagree with continuous year round management on pasture as it is very inappropriate as a universal standard. It will at times conflict with the protection of pasture vegetation stands, NRCS nutrient management plans, animal welfare, and can lead to soil compaction and soil and water quality management issues. We suggested striking the words "**continuous year-round management on pasture"** and replace it with "**provision of pasture throughout the grazing season to meet the requirements of 205.237."** We also suggest striking "**for: (i) Grazing throughout the growing season; and (ii) Access to the outdoors throughout the year, including during the non-growing season. Dry lots and feedlots are prohibited**," as this is dealt with elsewhere.

We suggest § 205.239 (a) (2) should read: "**For all ruminants, provision of pasture throughout the grazing season to meet the requirements of 205.237, except as otherwise provided in paragraph (c) of this section."**

§ 205.239 (a) (3)

We thank the NOP for addressing this issue of bedding which is widely interpreted in different ways by producers, inspectors and certifiers. We welcome the opportunity to suggest wording that will be clear and allow for universal interpretation of the standard while acknowledging different production systems.

As there are a multitude of different plant based materials used for bedding, we suggest striking the examples of bedding as it's not possible to name them all. By only naming a few examples in the rule it could be more confusing as to which materials will need to be certified organic. We suggest striking the words "**hay, straw, ground cobs, or."** We strongly encourage the NOP to actively educate certifiers and producers that these three listed materials are widely fed in ruminant livestock rations so are clearly not allowed as bedding unless certified organic
We suggest adding the words "**Genetically modified crop matter must not be used as bedding;"** to eliminate any doubt about some of these materials, address some non-compliance issues and illustrate the need for certifiers to know the source of all bedding materials. We recognize that in some areas there is limited certified organic straw available but in other areas it is sold into the conventional market for lack of organic buyers. Requiring straw to be organic will be a boon to organic crop growers who currently have no organic market and will help drive the increased organic production of small grains to supply the increased need. Also, many

producers whose certifiers do not allow conventional straw to be used, now purchase low quality organic hay to use as bedding and /or certify marginal land to harvest hay for bedding. There also are non plant materials that can be used for bedding such as sand. **We do not recommend any commercially available exemption clause as this will create many opportunities for abuse of high standards.**

We suggest that the wording for **§ 205.239 (a)(3)** should read**: Appropriate clean, dry bedding. When crop matter typically fed to the animal species is used as bedding, it must comply with the feed requirements of §205.237. Genetically modified crop matter must not be used as bedding;**

§ 205.239 (a) (4)
We agree with the need to supply shelter and wish to add the words "**as needed and appropriate to the species"** to clarify that shelters will vary in size and sophistication depending on which species is being housed, the climate, and the reason for housing, and to acknowledge that for some species in some locations, no shelter is needed.

We suggest the proposed **§ 205.239 (a) (4) section should read: Shelter, as needed and appropriate to the species, designed to allow for:**
(i) Natural maintenance, comfort behaviors, and opportunity to exercise;
(ii) Temperature level, ventilation, and air circulation suitable to the species; and
(iii) Reduction of potential for livestock injury;

§ 205.239 (a) (5)
We suggest moving **§ 205.239 (d)(2)** to **§ 205.239 (a)(5)** as more appropriate to this section. We suggest the addition of "feeding pads" to give a comprehensive list of livestock areas that need to be kept in good condition and be well drained. We suggest the substitution of lane for passage as that wording is more commonly used in livestock farming.

Our suggested new wording **§ 205.239 (a) (5): Yards, feeding pads, and laneways kept in good condition and well-drained;**

§ 205.239 (b)
This section deals with conditions which are required to provide temporary confinement and shelter exemption from access to the outdoors. We suggest the following changes:

1. Deleting "non-ruminant" from "non-ruminant animal" to allow the exemptions for all livestock, including ruminants. There are times when ruminants clearly need exemption for inclement weather (i.e. hail, thunderstorms, hurricanes, tornadoes, excessive heat and / or humidity, freezing temperatures, etc.), conditions under which the health, safety, or well being of the animal could be jeopardized (i.e. ice, deep snow, a known predator close by, etc.), and risk to soil and water quality (i.e. after large amounts of rain, after an atypically early or late snowstorm on unfrozen ground, flooded conditions, etc.) as do non-ruminant animals.

2. The insertion of "**provide temporary confinement"** and the striking of "**temporarily deny a non-ruminant animal access to the outdoors"** and the addition of **"and shelter for an**

animal." The new wording more accurately reflects the requirement of the exemptions for animals which may need both confinement and shelter for their welfare.

3. We suggest inserting "**and conditions caused by inclement weather"** after inclement weather as sometimes the residual effect of the weather is as a great concern as the weather itself, such as ice left after the storm, even though the sky has turned blue and the wind has died.

4.The proposed rule changed "stage of production" to "stage of life" which we welcome but would add the qualifier "**Lactation is not a stage of life that would exempt ruminants from any of the mandates set forth in this regulation"** to preclude the potential for abuse of the stage of life exemption, as the NOP has declared lactation a stage of life via the text in 205.230(c)(1) "the various life stages, such as lactation, are not an illness or injury".

We suggest the new wording for **§ 205.239 (b)** should be**: The producer of an organic livestock operation may provide temporary confinement and shelter for an animal because of:**

(1) Inclement weather and conditions caused by inclement weather;
(2) The animal's stage of life. Lactation is not a stage of life that would exempt ruminants from any of the mandates set forth in this regulation.
(3) Conditions under which the health, safety, or well being of the animal could be jeopardized; or
(4) Risk to soil or water quality.

§ 205.239 (c)
This section prescribes the conditions where the ruminant livestock may be temporarily denied pasture. We suggest adding "or outdoor access" as sometimes livestock might need to be confined for their own health or welfare.

Suggested wording for **§ 205.239 (c): The producer of an organic livestock operation may temporarily deny a ruminant animal pasture or outdoor access under the following conditions**:

§ 205.239 (c) (1)
We suggest adding **"for the day of breeding or for preventive health care practices, or for the"** as these are regular management tasks that may require temporary confinement of livestock.

Our suggested new wording**§ 205.239 (c) (1**): **When the animal is segregated for the day of breeding or preventive health care practice, or for the treatment of illness or injury (the various life stages, such as lactation, are not an illness or injury);**

§ 205.239 (c) (2)
We suggest adding **"one week at the end of a lactation for dry off, three weeks prior to parturition"** to allow the producer to implement effective preventive care of livestock at these critical times in the lactation. Additionally, three weeks prior to parturition gives leeway for times when the actual date of parturition varies from the expected due date, as it often does for

livestock just as it does for humans. Three weeks is enough to adapt the rumen papillae and the rumen microflora to a lactating diet that is higher in grain to facilitate maximizing dry matter intake after calving. Three weeks also allows for the use of Dietary Cation-Anion Difference (DCAD) science in ration formulation for cows prior to parturition. It has been shown that while 7-10 days is adequate time for the anionic ration to affect calcium metabolism and protect the cow from milk fever and the associated diseases of the sub-clinical hypocalcemia complex, less than three weeks is insufficient for the average cow due to our inability to predict accurate gestation length in individual cows. Cows with twins, heat stress, cold stress, and/or nutrition stress will calve early, sometimes by as much as 14 days. Cows may calve up to 14 days late when cow health and fetal health are excellent, and environmental stresses are minimized.

DCAD science is of extreme importance to cow health post-partum for many reasons, all related to the anionic ration's ability to induce calcium mobilization from the bone bank of calcium prior to calving. Many injuries (posterior paralysis due to pressure necrosis to muscle and nervous tissue, stepped on teats resulting in loss of teat, teat function, or facilitation of mastitis) and or death can be sequelae to clinical milk fever. Clinical milk fever has been shown to occur in an average of 4.7% of all calvings, increasing to 15% of cows that are 5^{th} lactation or older, and peaking at over 34% for cows in 11^{th} lactation. Milk fever has been shown to be linked to higher incidences of dystocia (7.2 x), retained placenta(4.0x), metritis(4.9x), cystic ovaries(3.9x) ketosis(23.6 x), mastitis(5.4x), displaced abomasums(4.9x) and culling(3.7x). Dietary control of milk fever is of paramount importance to the pre-partum cow's subsequent health and herd longevity, and is especially needed when pastures or forages are high in potassium or low in chloride.

Allowing three weeks to ensure the ability of dairy producers to employ nutrition science that aids dramatically in maintaining the health and well-being of the cow after parturition is a very minimal length of time invested compared to the six *month* exemption that we all agree is a necessary allowance for newborns.

References:

1. Curtis, Erb, Sniffen, Smith. JDS. 1984. 67:817-825.

#2 Curtis, Erb, Sniffen, Smith, Kronfeld. JDS. 1985. 68:2347-2360.

Our suggested new wording **§ 205.239 (c) (2): One week at the end of a lactation for dry off, three weeks prior to parturition (birthing), parturition, and up to one week after parturition;**

§ 205.239 (c) (3)
We suggest adding **"during the grazing season"** after the word pasture to bring this section for youngstock in synchrony with our recommended change in 205.239 (a)(2) to only require management on pasture during the grazing season. We agree with the prohibition on individual housing (except for individual segregation during treatment for illness or injury as allowed in 205.236(c)(1)) for youngstock after six months of age and agree that youngstock after six months of age must be on pasture during the grazing season.

Our suggested new wording for **§ 205.239 (c) (3): In the case of newborns for up to six months, after which they must be on pasture during the grazing season and may no longer be individually housed;**

§ 205.239 (c) (4):
We suggest deletion of this subpart: In the case of goats, during periods of inclement weather, as it's been dealt with above at § 205.239 (a) (4).

§ 205.239 (c) (5):
We suggest the deletion of "In the case of sheep" as sheep are not the only animals sheared. It should be open to other ruminant livestock species that may be sheared, for example yaks, goats, llamas and alpacas.

Suggested wording for **§ 205.239 (c) (5): For short periods for shearing: and**

§ 205.239 (c) (6) we have only one suggested change to strikeout **"growing"** and replace it with **"grazing"** for season.

§ 205.239 (d)
We suggest the deletion of **§ 205.239 (d) (1) through (6)** as these conditions are covered elsewhere or can be included as guidance. 205.239(d) is redundant to livestock living condition requirements already outlined in 205.239(a) and (c). Each subpart is already addressed elsewhere in the rule. 205.239(a) (3) requires clean dry bedding. We have recommended moving (d) (2) to 205.239(a) (5). 205.239(a) (1) requires shade. 205.239(a) (1) as amended requires clean water. 205.239(c) (3) as proposed requires newborns to be on pasture after six months of age. The proposed text of the final subpart (6) is overly prescriptive by requiring hay at 7 days and does not allow producers to implement animal husbandry practices tried and tested at their individual operations.

§ 205.239 (e and f)
We feel this section is too prescriptive and could conflict with the requirement of local agencies. The management of manure is legally prescribed in many different ways depending on the State and/or Federal agency. Many producers are already enrolled in an NRCS manure management plan whose standards vary depending on location, soil type and other local conditions. It is also a prerequisite for organic certification that the producer manage their operation to not put soil and water quality at risk. The use of the word buffer here is confusing as its use within organic certification is defined as the distance between certified and non certified land. We suggest that the wording from **§ 205.239 (f)** "must manage outdoor access areas, including pastures, in a manner that does not put soil or water quality at risk" be merged with § 205.239 (e) to become the new (d) and the rest of (f) "This may include the use of fences and buffer zones to prevent ruminants and their waste products from entering ponds, streams, and other bodies of water. Buffer zone size shall be extensive enough, in full consideration of the physical features of the site, to prevent the waste products of ruminants from entering ponds, streams, and other bodies of water," be deleted**.**

Our suggested wording for **§ 205.239 (e)** which becomes **(d): The producer of an organic livestock operation must manage manure in a manner that does not contribute to contamination of crops, soil, or water by plant nutrients, heavy metals, or pathogenic organisms and optimizes recycling of nutrients; and must manage outdoor access areas, including pastures, in a manner that does not put soil or water quality at risk.**

§205.240 Pasture practice standard.
We have heard from producers and certifiers that, in the absence of an Organic Best Management Practices for Ruminant Livestock Operations manual, they would appreciate some prescription within this rule to help guide them in their work. For that reason we support the retention of this section with some editing.

We strongly support the wording in the Proposed Rule for **§205.240** and **§205.240 (a)**

The producer of an organic livestock operation must, for all ruminant livestock on the operation, demonstrate through auditable records in the organic system plan, a functioning management plan for pasture that meets all requirements of §§ 205.200 - 205.240.

(a) Pasture must be managed as a crop in full compliance with §§ 205.200 through 205.206.

§205.240 (b)
This subpart supports the need to have a pasture plan within the organic system plan and our suggested language will allow more flexibility in how the producer works with the certifier to supply enough information and data to be in compliance.

Suggested language for **§205.240 (b**): **A pasture plan containing at least the following information must be included in the producer's organic system plan, which may consist of the certifier's farm and livestock questionnaires, and be updated annually when any changes are made. The pasture plan must show the following:**

§205.240 (c)
We suggest the deletion of line (c) and subparts to (c) will end up as subparts to (b) with revisions as suggested below.

§205.240 (b)(1)
We suggest the addition of the following language as defining what needs to be in the pasture plan and to emphasize that the pasture must meet all the requirements of the Livestock Feed section.

Suggested language for **§205.240 (b) (1): The types of pasture provided to ensure that the feed requirements of 205.237 are being met.**

§205.240 (c) (2) becomes §205.240 (b) (2)

We suggest some changes to the wording of this subsection to provide clarity without too much prescription.

Suggested wording for **§205.240 (b) (2): Cultural and management practices to be used to ensure pasture of a sufficient quality and quantity is available to graze throughout the growing grazing season and to provide all ruminants, except for exempted classes, under the organic systems plan with an average of not less than 30 percent of their dry matter intake from grazing throughout the grazing season;**

§205.240 (c) (3)
Delete this subsection as detailed information about the haymaking system is not a necessary part of a pasture plan and the information will be found elsewhere in the organic systems plan.

Delete: **The haymaking system**

§205.240 (b)(3)
The basis of the pasture plan is the grazing season and we recommend that a clear description of the grazing season expected for the operation is an essential part of any plan.

We suggest the following new language as **§205.240 (b) (3): Description of the grazing season.**

§205.240 (b) (4)
This subsection prescribes how much information is required in a pasture plan to show where pastures are located and their size to enable a certifier to assess the livestock carrying capacity of the operation. We have deleted information that is recorded elsewhere in the organic systems plan and does not relate directly to a pasture plan.

We suggest the following amended language for **§205.240 (b) (4): The location of pastures, including maps giving each field its own identity;**

§205.240 (c) (5) becomes §205.240 (b) (5)
We support the retention of this subsection without amendment.

§205.240 (c) (6) becomes §205.240 (b) (6)
We support the retention of this subsection, with the exception for temporary fences, some of which are moved on a daily basis or multiple times a day in some grazing systems.

We suggest the following amended language for **§205.240 (b) (6): The location and types of fences, except for temporary fences, and the location and source of shade and water;**

§205.240 (c) (7) becomes §205.240 (b) (7)
We support the retention of this subsection without amendment.
(7) The soil fertility, seeding, and crop rotation systems.

We recommend that §205.240 (b) 8-11 be deleted from the rule as (8), (9), and (11) should be covered in the organic systems plan annual updates via pasture now being considered a crop. We recommend the deletion of (10) as its meaning is unclear

§205.240 (d)
There are many producers who view and use sacrificial pasture as an acceptable practice so long as it's not detrimental to soil and water and fits within their NRCS management plan. Those producers who use sacrificial pasture will return this land to a crop / pasture as part of their rotation and / or pasture renovation plan. We believe that it gives more opportunity for producers to use this as a management tool if they have the right land and location, increasing the production options for producers.

However, requiring each and every organic livestock producer to have sacrificial pasture that meets all of the characteristics as defined would be contradictory to the basic tenants of organic production outlined in 205.200 and is untenable. We believe the same consumers who envision a pasture-based system would agree that forcing producers to destroy part of their operation in order to leave animals on pasture during conditions not conducive to pasturing in the first place is inappropriate and unrealistic. This subpart may also contradict local government body regulations regarding soil and water quality in some locations.

We believe that sacrificial pasture should not be mandatory and strongly urge that the word "must" be deleted and the word "may" be inserted. So long as "may" governs the use and it doesn't become mandatory we support the inclusion of this provision. We suggest adding **"or where animals are kept in the non-grazing season to provide access to the outdoors"** as a description of its appropriate use during the non-grazing season. We suggest deletion of the subparts (1), (2), and (4) as they are duplication of what is already included in the definition of sacrificial pasture, and deletion of (3) as those provisions will often be contradictory and not achievable in the short term given the conditions that sacrifice pasture is used under (i.e. with the known purpose that the vegetative cover may be sacrificed).

Suggested language for§205.240 (d): **The pasture system may include a sacrificial pasture for grazing, to protect the other pastures from excessive damage during periods when saturated soil conditions render the pasture(s) too wet for animals to graze; and for outdoor access in the non-grazing season.**

§205.240 (e)
We welcome the inclusion of the existing language in the proposed Rule: In addition to the above, producers must manage pasture to comply with all applicable requirements of §§ 205.236 - 205.239.

We recommend the following be put in a guidance document or in an "Organic Best Management Practices for Ruminant Livestock Operations" to assist producers and certifiers with their interpretation of the rule.

§ 205.239 Livestock living conditions Guidance

Ruminants must be provided with:

1. A lying area with well-maintained clean, dry bedding, which complies with paragraph 205.239(a)(3) during periods of temporary housing, provided due to temporary denial of pasture during grazing and during the non grazing season;
2. Feeding and watering equipment that are designed, constructed, and placed to protect from fouling--such equipment must be cleaned as needed.
3. In the case of newborns, forage beginning 7 days after birth, unless on pasture, and pasture for grazing in compliance with § 205.240(a) not later than six months after birth.

The producer of an organic livestock operation must manage outdoor access areas, including pastures, in a manner that does not put soil or water quality at risk. This may include the use of fences and filter strips to prevent ruminants and their waste products from entering ponds, streams, and other bodies of water. Filter strip size shall be extensive enough, in full consideration of the physical features of the site, to prevent the waste products of ruminants from entering ponds, streams, and other bodies of water.

§205.240 Pasture practice standard Guidance:

At no time during the grazing season, when any class of ruminant receives less than 30% of their dry matter intake from grazing, except for exempted classes, shall the operation mechanically harvest crops from its pastures, showing intent to maximize grazing over other feeding systems throughout the grazing season.

Pasture Plan Guidance:

In addition to §205.240 (b), the comprehensive pasture plan must include a detailed description of:

1. The pest, weed, and disease control practices;
2. Forage conservation
3. The erosion control and protection of natural wetlands, riparian areas, and soil and water quality practices; and
4. Restoration of pastures practices**.**
5. When there is no change to the previous year's comprehensive pasture plan the certified operation may resubmit the previous year's comprehensive pasture plan.

§205.240 (d): Sacrificial Pasture Guidance

A sacrificial pasture must be:

1. Sufficient in size to accommodate all animals in the herd without crowding;
2. Located where:
   (i) Soils have good trafficability;

(ii) Well-drained;
(iii) There is a low risk of soil erosion;
(iv) There is low or no potential of manure runoff;
(v) Surrounded by vegetated areas; and
(vi) Easily restored.

3. Managed to provide feed value when used during the grazing season,; and.
4. Restored through active pasture management.

Guidance for § 205.237
Measuring Dry Matter—One Possible Method:
(1) Document each feed ration (i.e., for each type of animal, each class of animal's intended daily diet showing all ingredients, daily pounds of each ingredient per animal, each ingredient's percentage of the total ration, the dry matter percentage for each ingredient, and the dry matter pounds for each ingredient) as it changes throughout the year;
(2) Document the daily dry matter demand of each class of animal using the formula:

- Average Weight/Animal (lbs) × X = lbs DM/Head/Day × Number of Animals = Total DM Demand in lbs/Day where:
  a) X=.035- .04 for lactating dairy cows,
  b) X=.02-.025 for dry dairy cows and dairy youngstock,
  c) X=.025 for lactating beef,
  d) X=.02 for non lactating beef,
  e) X=?? for goats, sheep, wild game;

(3) Document how much dry matter is fed to each class of animal in all rations; and
(4) Document the percentage of dry matter fed in all rations to each class of animal using the formula: (DM Fed ÷ DM Demand in lbs/day) × 100 = % DM Fed.

National Research Council (NRC) tables for dairy says: "DMI ranges from 2.25 % of live weight at 52 percent digestibility to 4.32 % of live weight at 75 % digestibility". If we presume feeds are greater than 70% digestible, than the 4% DMI for lactating milk cows is justified.

Plugging in numbers for an operating farm:
From the formula: 1350 lbs average weight/lactating animal x .04 = 54 DM Demand in lbs/Day So that means our lactating cows should be eating 54 lbs of DM daily. If we are feeding a ration with the following components / cow: 55 pounds of haylage at .38% DM (55 x .38=20.9 lbs DM), 10 lbs high moisture shell corn at .75 DM (10 x .75=7.5lbs DM), 3 lbs of wheat midds at .88%DM (3x.88=2.64 lbs DM) for a total intake of 31.04 lbs of DM from fed feeds. Therefore, I take the DM demand of this class of animal at 54 lbs/day and subtract the DMI from fed feeds of 31.04 to come up with 22.96 lbs coming from pasture. 31.04lbs of DM from fed feeds divided by 54 lbs = 57.5 % of ration is from fed feeds.

Attachment E: Food Farmers report on measuring Dry matter

1. **Attachment A: Letters from processing companies advocating for:**
    i. ***The grazed feed must provide significant intake for all milking-age organic dairy cows. At a minimum, an average of 30% of the dry matter intake each year must come from grazed pasture during the region's growing season, which will be no less than 120 days per year.***

Letters from:

a) **Organic Valley, Humboldt Creamery and Stonyfield Farm**
b) **Upstate Niagara Cooperative**
c) **HP Hood LLC**
d) **Organic Dairy Farmers Cooperative Inc.**
e) **Organic Choice**

May 28, 2008

Under Secretary Bruce Knight
Under Secretary for Marketing and Regulatory Programs
U.S. Department of Agriculture
1400 Independence Ave., S.W.
Washington, DC 20250

Dear Under Secretary Knight;

For the past six years, CROPP Cooperative, Stonyfield Farm and Humboldt Creamery Cooperative have used the USDA Organic Seal and certification program on our cartons and packaging, and this partnership with the USDA has been very successful. Although not the only factor, the National Organic Program certainly has been a large part of the incredible growth each of us has experienced in the last few years. Consumers who see the seal on the packaging are confident that the product has been produced in accordance with the organic standards.

Maintaining the consumers' and producers' confidence is critical, as you well know. With any industry, there are always challenges to the consumers' confidence in a product, and those challenges must be met. In the organic industry, because of the high standards, and the ideals around organic, there seems to be an abundance of these challenges, for better or worse.

We are seeking your continued assistance in meeting these challenges. Whether through class action lawsuits, state regulations, or standards questions, the challenges come in many shapes. We urge the USDA to protect the organic certificate when it is challenged, and by supporting the strength and meaning of that certificate, consumers can continue to have confidence that it represents the strongest certification program in the world.

Recently, we understand you have been asked by NODPA, NOC, and Whitewave Foods to issue a new pasture rule. As we have in the past, we too encourage you to

issue a pasture standard reflecting the NOSB recommendation and taking the added step of including a measurable requirement of 30% DMI into the pasture rule, not in the guidance as recommended by NOSB. We have found in our own farming community of more than 1000 organic dairy farmers that the NOSB recommendation, with the addition of the 30% DMI, is workable and enforceable. We have included CROPP Cooperative's internal standard that has been enforced through the cooperative as well as the FOOD Farmers' proposal which nicely restates the NOSB standard with the addition of the 30% DMI which reflects our recommendation as well.

We also hope that you can implement other recommendations of the NOSB, including the recommendation on cloning and origin of livestock. These are open issues in the organic standards that must be addressed. We know that these things do take time and resources, but with organic agriculture being a shining, growing star of agriculture, it is time and resources well spent.

Together, we thank you for your work on behalf of the organic foods movement. We would be happy to respond to any questions you may have.

Yours truly,

George L. Siemon
Chief Executive Officer
CROPP Cooperative/Organic Valley

Rich Ghilarducci
CEO/President
Humboldt Creamery Cooperative

Nancy Hirshberg
Vice President of Natural Resources
Stonyfield Farm, Inc.

Approved by BOD 2/8/07

CROPP COOPERATIVE PASTURE POLICY

Pasture Requirement

Organics is about integrity and commitment to sustainable farming. CROPP producers sign the CROPP membership agreement and are bound to abide by any additional standards approved by the CROPP Board. The CROPP Board and the Dairy Executive Committee have decided adequate pasture is a critical organic principle within organic livestock production. The following policy is a requirement for all CROPP dairy pool members. A Farm Pasture Plan must be on file for each member, demonstrating compliance with the Pasture Standards. Any members that do not satisfy the pasture standard will be enrolled in a Work Improvement Plan in order to come into compliance within one year.

Definition of Pasture

A pasture consists of a mixture of nutritious grasses, legumes and variable plant species, attached to their respective root systems. Pasture must be managed to prevent degradation
of soil and water quality.

CROPP Pasture Standards

1. A lactating cow must be provided 120 days on pasture per each growing season.
2. A minimum average of 30% dry matter intake of the total lactating cow's diet must come from grazed pasture during that region's grazing season.
3. The stocking rate for pasture is a maximum of three (3) lactating cows per acre of pasture. (If you can demonstrate a higher stocking rate is sustainable on your farm that will be acceptable.)
4. Dry cows must have a least 30 days access to pasture if that coincides with the grazing period for that region.
5. Young animals must have some introduction to pasture after six months of age. After one year of age, they must have access to pasture, coinciding with that region's grazing period.

Farm Pasture Plan Requirements

1. Ruminant livestock must have access to graze pasture during the months of the year when pasture provides edible forage, and the grazed feed must provide a **significant** portion of the feed requirements during those months but no less than a minimum average of 30% dry matter. The Farm Pasture Plan must illustrate how the producer will **optimize** the pasture component of the total feed used in the farm system. The Farm Pasture Plan must quantify how the CROPP Pasture Standards will be met.
2. The producer of ruminant livestock may be allowed temporary exemption to pasture because of:
    a. Conditions under which the health, safety, or well-being of the animal could be jeopardized.
    b. Inclement weather
    c. Temporary conditions which pose a risk to soil and water quality.
3. The producer of ruminant livestock may be allowed exemption to pasture during the following stages of production:
    a. Dairy stock under the age of 6 months
    b. Birthing

Resources:

NRCS (Natural Resources Conservation Service): offers guidelines specific to a producer's home locale. Cost-sharing may be available.

CROPP Pasture Mentor Program:

Producers will be available to serve as mentors to help those producers in need to guidance and expertise to expand their pasturing operations.

FEDERATION OF FOOD FARMERS
(from Letter to Mr. Knight, dated May, 2008)

Access to Pasture standards

1. *Organic dairy livestock over 6 months of age must graze on pasture during the months of the year when pasture can provide edible forage.*
2. *The grazed feed must provide significant intake for all milking-age organic dairy cows. At a minimum, an average of 30% of the dry matter intake each year must come from grazed pasture during the region's growing season, which will be no less than 120 days per year.*
3. *Temporary exemption from pasture may be allowed because of:*
    i. *Conditions under which the health, safety, or well-being of the animal could be jeopardized, including to restore the health of an individual animal or to prevent the spread of disease from an infected animal to other animals.*
    ii. *Short term inclement weather.*
    iii. *Temporary conditions which pose a risk to soil and water quality.*
    iv. *In no case will temporary confinement and exemption from this pasture standard be allowed as a continuous production system.*

The measurement of the consumption of dry matter from grazed pasture will be calculated based on the daily dry matter intake from grazing averaged over the total time period grazed per year.

Bobby L. Hall
Chief Executive Officer
June 24, 2008

Under Secretary Bruce Knight
Under Secretary for Marketing and Regulatory Programs
U.S. Department of Agriculture
1400 Independence Ave., S.W.
Washington, DC 20250

Dear Under Secretary Knight:

We are writing to express in our support for the immediate publication of well-defined access for organic pasture standards. We want to see the publication of a rule that clearly states the following as a minimum for compliance:

Access to Pasture Standards

2. ***Organic dairy livestock over 6 months of age must graze on pasture during the months of the year when pasture can provide edible forage.***

3. ***The grazed feed must provide significant intake for all milking-age organic dairy cows. At a minimum, an average of 30% of the dry matter intake each year must come from grazed pasture during the region's growing season, which will be no less than 120 days per year.***

4. ***Temporary exemption from pasture may be allowed because of:***

    - ***Conditions under which the health, safety, or well-being of the animal could be jeopardized, including to restore the health of an individual animal or to prevent the spread of disease from an infected animal to other animals.***
    - ***Short-term inclement weather.***
    - ***Temporary conditions, which pose a risk to soil and water quality.***
    - ***In no case will temporary confinement and exemption from this pasture standard be allowed as a continuous production system.***

The measurement of the consumption of dry matter from grazed pasture will be calculated based on the daily dry matter intake from grazing, averaged over the total time period grazed per year.

Our Cooperative supports these standards for all certified organic dairy farms. We join with others in the organic industry to publicly ask that you use all the influence of your department to speed the publication and rapid implementation of the clarification of the access to pasture rule.

Sincerely,

Bobby L. Hall
Chief Executive Officer

Daniel Wolf
President

HP Hood LLC Six Kimball Lane Lynnfield, MA 01940 (617) 887-3000

May 29, 2008

Under Secretary Bruce Knight
Under Secretary for Marketing and Regulatory Programs
U.S. Department of Agriculture
1400 Independence Ave., S.W.
Washington, DC 20250

Dear Under Secretary Knight:
I write to you on behalf of HP Hood LLC and our more than 300 organic dairy farmers in support of the publication of a well-defined access-to-pasture standard under the USDA Organic certification program. As a manufacturer of organic milk products, we urge you to quickly issue and enforce a pasture standard to reflect the NOSB recommendations.

In addition to obtaining and maintaining organic certification through a USDA accredited certification organization, Hood and other leaders in the industry have already adopted pasture standards and we urge your administration to require that dairy animals over the age of 18 months be required to have a minimum of 120 days access to pasture during the growing season; that 30% of the total ration's dry matter intake of lactating dairy animals be provided by grazing; and that dairy animals six months and older be required to have access to pasture in accordance with the region's growing season.

HP Hood and other dairy manufacturers have responded to consumer requests for choice in the dairy aisle, including USDA Certified Organic milk and dairy products. Consumer trust and confidence remains a priority for the industry as consumers of organic dairy products must be assured that the products they consume are regulated under the most stringent guidelines of the program. Formalizing and enforcing an access-to-pasture standard will only help strengthen and preserve the integrity of the USDA Certified Organic program and its products.

Once again we urge you to expedite the publication and implementation of clearly defined access-to-pasture standards.

Thank you for your consideration.

Sincerely,
Mike Suever
Senior Vice President, R&D, Engineering and Milk Procurement
HP Hood LLC

Organic Dairy Farmers Cooperative, Inc.
12 NORTH PARK STREET
SENECA FALLS, NEW YORK 13148

May 21, 2008

Under Secretary Bruce Knight
Under Secretary for Marketing and Regulatory Programs
U.S. Department of Agriculture
1400 Independence Ave., S.W.
Washington, DC 20250

Dear Mr. Knight:

I am writing to express in the strongest terms our Cooperative's support for the immediate publication of strict and well defined access to pasture standards. We want to see the publication of a rule that clearly states the following as a minimum for compliance:

Access to Pasture standards

1. *Organic dairy livestock over 6 months of age must graze on pasture during the months of the year when pasture can provide edible forage.*
2. *The grazed feed must provide significant intake for all milking-age organic dairy cows. At a minimum, an average of 30% of the dry matter intake each year must come from grazed pasture during the region's growing season, which will be no less than 120 days per year.*
3. *Temporary exemption from pasture may be allowed because of:*
    i. *Conditions under which the health, safety, or well-being of the animal could be jeopardized, including to restore the health of an individual animal or to prevent the spread of disease from an infected animal to other animals.*
    ii. *Short term inclement weather.*
    iii. *Temporary conditions which pose a risk to soil and water quality.*
    iv. *In no case will temporary confinement and exemption from this pasture standard be allowed as a continuous production system.*

The measurement of the consumption of dry matter from grazed pasture will be calculated based on the daily dry matter intake from grazing averaged over the total time period grazed per year.

Our cooperative members support the strictest interpretation of these standards by all organically certified organic dairies. The meeting you recently had with representatives from the National Organic Coalition, the Federation of Organic Dairy Farmers, and WhiteWave Foods showed their support and the support of the whole organic community for the publication and implementation of strict standards.

We join with others in the organic industry to publicly ask that you use all the influence of your department to speed the publication and rapid implementation of the clarification of the access to pasture rule.

Sincerely,

Daniel France

President, Organic Dairy Farmers Cooperative

cc: J. Burton Eller, Jr., Barbara Robinson, Richard Mathews, Ed Maltby, Sharad Mathur, Mimma Kisor

Attachment B: "Extending the grazing season" by John Cockerall of the University of Wisconsin

TECHNIQUES FOR EXTENDING THE GRAZING SEASON

Prepared by
John R. Cockrell
UW-Extension Grazing Specialist

Most livestock producers are aware that pasture harvested by the cow is cheaper than forage which is harvested, stored and then removed from storage and fed to the cow. Some studies show that pastured forage costs about 1 to 1½ cents per pound of dry matter (DM) in the cow with most of the manure applied back on the pasture. Stored forage costs about 4 to 5 cents per pound of DM plus the cost of storage, feeding and manure hauling. Unfortunately, most livestock producers in the Upper Midwest don't understand the principles of good pasture management. Therefore, they are only able to utilize cheap pasture forage for a few months each year. Let's look at some of the methods we can use to extend the grazing season.

In Southern Wisconsin, our typical pasture growing season consists of 5 months of rapid growth (May, June, July, August and September), 2 months of slow growth (April and October) and 5 months of no growth (November, December, January, February and March). We must understand that pasture growth rates can be greatly influenced by rainfall and temperature from year to year just like they are in New Zealand, Ireland and Australia. However, there are cow calf producers in Southwestern Wisconsin who regularly graze their cows 12 months out of the year. With a little cooperation from the weather, they will get most of the cows' feed from pasture 7-8 months of the year and they get some of the cows' feed requirements from pasture 4-5 months of the year. While rainfall, temperature and snow depth can greatly influence pasture productivity and/or availability, experienced graziers soon develop management techniques to reduce the impact on their livestock.

Some management practices used by experienced graziers to lengthen the grazing season are as follows:

I. Fertilization

Proper fertilization is essential for maximum pasture productivity. Well fertilized pastures will not only grow more DM per acre, but will also be higher in protein and energy and will be more palatable, which will improve DM intake. The end result is improved livestock performance.

While adequate fertilization will improve pasture productivity and utilization, over- fertilization is a waste of money and a very poor environmental practice. To determine pasture fertilizer needs, run plant tissue analysis every few years. Tissue analysis is superior to soil testing, because it tells you what is in the plant which is all that matters. Also, tissue sampling is the most accurate method to evaluate the availability of trace elements. Apply corrective fertilizer according to test recommendations. If you are not familiar with taking plant tissue samples, contact your local Extension Office for assistance.

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I would recommend the application of 40 to 50 units of nitrogen fertilizer starting in early June and continuing after each grazing or mechanical harvest. Also, I would time the last application for about the middle of October. This will build a strong root system and promote early growth next spring. The biggest mistake many farmers make is to delay nitrogen application until deficiency symptoms show up (i.e. yellow grass). We then must get the nitrogen on the pasture, wait for rain, wait for the nitrogen to enter the plant through the roots and then wait for the plant to grow. This practice just wasted 4 to 6 weeks out of an already short growing season. High quality pasture is the cheapest feed source for your cows. Saving a few dollars on fertilizer could be very costly.

Also, you will find that well fertilized pastures are much more drought tolerant than low fertility pastures, therefore, extending the grazing season.

II. Subdividing Pastures

Proper pasture layout is essential for easy pasture management. I would suggest rather large paddocks which are zone fenced. For example, keep everything the same if possible, like south slopes fenced

separately, fence north slopes separately, separate bottoms from sloping hillsides and ridge tops, etc. Large paddocks can be further subdivided with an electrical tape when necessary.
When pastures are ready to graze, the cattle should be given an area they can harvest in 12 hours to 3 days, depending on type of livestock and production goals. For example, many dairy graziers will move fresh cows to new grass after every milking, stockers may be moved in 1 to 2 days, and cow-calf graziers may give larger breaks for 3 days. Regardless of length of occupation, paddocks must be properly sized so that cows will clean up most of the available forage. This practice will assure vegetative regrowth and high quality forage availability in the next round. Pasture forage that is not grazed in previous rounds probably will not be grazed at all, and even if it is grazed, it will be low quality forage. After 5 days, grazed plants will begin to put out new shoots. If cattle are allowed to graze regrowth, this will result in less and less forage available as the grazing season progresses. One experienced grazier said, "You might just as well put herbicide on your pastures as to graze them for long durations." This is the primary reason continuous grazed pastures are usually done by early to mid July.

III. Rest Periods

Properly subdivided and fertilized pastures allow for rapid growth and quick harvest. A proper rest period allows the root system to grow and recover from the previous grazing. Studies have shown that severe defoliation greatly reduces the plant's root system. When severe defoliation is followed by a dry period, the results will be a forage deficit. On the

other hand, when no more than 50% to 60% of the plant is defoliated, there is little reduction in the size of the root system. Therefore, a good rule of thumb is to graze half and leave half. However, if we turn cattle in on 6 inch tall pastures, we would probably want to graze 4 inches and leave 2 inches since there is more DM in the bottom half than the top half of the plant.
Another good rule of thumb to follow is when pasture growth is slow, slow down the rotation. In other words, lengthen the rest period. To do this may require that you feed supplemental feed. But when pasture growth is rapid, you should speed up the rotation or have shorter rest periods. This sounds simple, but most new graziers do just the opposite for some reason.

IV. Stockpiling

In Ireland they call it building a feed wedge, in New Zealand it is called autumn saved pasture, and in the Upper Midwest we use the term stockpiled pasture. No matter what the practice is called, it is the nuts and bolts of pasture management which allows us to extend the grazing season into periods of slow and no pasture growth.

(a) Summer Stockpiling

First of all, it usually pays to carry some surplus pasture into our potentially hot and dry July-August period. This can be accomplished by keeping a fair amount of fresh grown pasture ahead of you and slowing down the rotation. If daily growth rates drop below daily cattle demand, use supplemental feed early on so you can keep grazing through the dry period. If the rains continue, the surplus will need to be harvested to keep pastures in a vegetative growth stage.

(b) Fall And Winter Stockpiling

Beginning around August 15th, we should divide the farm into thirds to accumulate surplus stockpiled pasture for late fall and winter grazing. The first 1/3 of the pastures will be grazed hard from late August through September and October. Pastures will need to be fertilized ahead of this period to ensure adequate growth as discussed earlier. During dry falls and until pastures become well established, you may need to feed supplemental forage and/or grain. The remaining 2/3 of the farm will be allowed to grow from late August through the end of October. We will then take 1/3 of the farm which contains the stockpiled forage and graze it during late fall and early winter. This will be very high quality pasture. Pasture grown in the fall doesn't lose quality like it would in the spring. You will find that dry cows will fatten very rapidly on this forage. You will need to use electric tapes to ration out the feed supply to

prevent cows from becoming overly fat and trampling the remaining pasture. Do Not feed grain except in cases of severe pasture shortages to non lactating cattle.

The remaining 1/3 of the stockpiled pasture will be reserved for mid to late winter feeding. To make this practice effective, you will need to know your farm. For example, learn where the slopes and ridges are that accumulate the least amount of snow. Save these areas for mid to late winter grazing. While you will need to feed supplemental feed during this period, you can greatly reduce labor requirements by feeding as much pasture as possible. Many graziers will leave wrapped bales in these areas for winter supplementation, therefore reducing the need to move feed in the winter.

Benefits Of Stockpiling

There are 2 primary benefits from stockpiling practices described above.

1. We are able to greatly reduce the use of stored feed during the late fall and winter. This practice not only saves money, but labor as well.
2. We stagger the spring green up so that pasture management becomes a little easier. The first new growth to appear will be in the 1/3 of the farm that was grazed in late winter and early spring. Don't forget the fall fertilization practices mentioned earlier if you want early spring grazing. We probably get early green up in this area first, because the roots were able to collect stored carbohydrates all fall and were insulated by the top growth during the winter. When this top growth is removed in late winter or early spring, the plant is ready to grow.

The second area to green up a few weeks later will be the 1/3 that was grazed in the late fall and early winter. I suspect this occurs because the root has lots of stored carbohydrates, but lacked insulation from the top growth all winter.

The last area to green up will be the 1/3 of the farm that was grazed hard during late summer and early fall. These roots were not allowed to store carbohydrates and had no insulation. This is primarily why people who over graze their farm all fall rarely have enough pasture to fully feed their cows before mid May to early June. If this is followed by a hot, dry period in July or August, we can see that these farmers will have a very short grazing season. They will probably tell the world that grazing doesn't work in the Upper Midwest. Actually, in their case, they are absolutely correct.

V. Other Practices

Some graziers will plant a few acres of corn to be left standing in the field all winter. The corn will stand up through the snow and can be utilized during periods of heavy snowfall. This is a very low cost, low labor feeding system. With a little thought, I am sure you can develop other low cost, low labor feeding systems that will work on your farm. Remember, grazed forage costs 1½ cents per pound of DM and is very low labor while stored feed will cost 4-5 cents per pound of DM and has very high labor requirements. Therefore, thinking and planning can be very profitable.

VI. Caution

While many of the practices described above sound fairly simple, it takes experience and practice to implement them successfully. As we all know, there can be some very brutal winters in the Upper Midwest from time to time and you will always need to have a backup plan in place. This could mean buying feed or wintering cows off the farm, but you definitely must have a plan.

VII. In Conclusion

Feeding stored feed to cattle is very costly and labor intense. However, the system is fairly well understood and for most farmers is a no-brainer. On the other hand, grazing can be very low cost and low labor, but it is very management intense. Much of the time you used to spend doing manual tasks will be spent thinking. You will save money and/or increase profits only if you make the correct decisions and implement the practices successfully into your management. To be a successful grazier,

you must enjoy the challenge. If you don't enjoy the challenge of grazing, your chances for success will be very slim.

To increase your chances for success I would suggest graziers with similar goals and interests (i.e. cow-calf, stocker, or dairy graziers) form discussion groups and share information. Remember as graziers you are the primary source of new information available today. There are very few agribusinesses that are willing to spend time and/or money to show you how to reduce cost. I learned the information presented in this paper from farmers and hope that you can use it to improve the profitability of your grazing business.

Attachment C: "Does Pasture Finished Beef make the Grade" is a 2008 study by University of Wisconsin

Does pasture-finished beef make the grade?

Center for Integrated Agricultural Systems • UW-Madison College of Agricultural and Life Sciences • Sept. 2008

Research Brief #77

Finishing beef animals on pasture can potentially reduce the overhead costs of facilities and equipment compared to confinement finishing. Researchers at UW-Madison set out to learn if beef animals finished on pasture can make the Select and Choice quality grades for conventional meat markets.

The researchers—Jeff Lehmkuhler from Animal Sciences and Dan Undersander from Agronomy—investigated the performance of steers on pasture with and without supplements. The researchers compared crossbred beef steers typical of Wisconsin beef farms to crossbred Normande steers. The Normande breed is a dual purpose milk/meat breed which is growing in popularity. The purpose of this comparison was to determine if Normande-cross steers are a viable option for farmers finishing beef animals. From 2005 to 2007, the researchers collected data at the UW-Madison Lancaster Agricultural Research Station. Support was provided by a USDA-CSREES HATCH grant.

The researchers compared a diet based exclusively on pasture with three supplementation strategies. A diet of pasture plus alfalfa pellets was one strategy, chosen because alfalfa pellets can provide forage-based protein and dry matter for grazing cattle when pasture availability is low. The other two pasture supplements included soyhulls and dried distillers grains. One of these two treatments included an ionophore (an antibiotic added to cattle feed to prevent disease and promote efficiency), which allowed for the comparison of natural and conventional production systems. Dried distillers grains were of interest because of their growing availability, high levels of undegradable protein and unsaturated fatty acid content. Soyhulls were included due to high fiber digestibility. Steers were offered up to 9 pounds of supplement per head daily, which provided an estimated 50 percent of each animal's daily dry matter intake over the grazing season.

Forty-eight steers were grazed each season. These animals were divided equally across the four supplementation treatments (12 steers per treatment). The use of electronic gates fastened to feed bunks allowed for all treatments to be offered in the same pasture area, reducing the impact of pasture type and quality on the responses from the supplementation strategies. The pastures were predominately a cool-season grass legume mixture. Steers were moved to new areas of pasture three times weekly.

Of the 12 steers assigned to each treatment, half were of Normande influence and the remaining were crossbred beef steers of British genetics, predominately Angus and Hereford sired. Regardless of genetics, the target beef quality grade was Select or higher. From an economic standpoint, it is important to produce carcasses with sufficient marbling to attain at least a Select grade.

Alfalfa supplement intake varied considerably between animals. A few steers consumed nearly all 9 pounds offered while others ate only a couple of pounds. There was less variability in the intake of both grain co-product supplements. During the grazing season, steers receiving alfalfa pellets consumed approximately two-thirds the amount of supplement by weight as those receiving the grain co-product.

Supplementation and rate of gain

"Supplementation, regardless of type, increased daily gains for steers in all three years" says Lehmkuhler. (See Fig. 1 on page 2.) Alfalfa pellets increased daily gains by approximately 0.25 lb/day in comparison to the pasture only treatment. Co-product supplementation increased daily gains even more. The inclusion of an ionophore significantly increased gain in only one of the three years. This lack of consistent gain response was observed in previous supplementation research at the station with a different ionophore.

Carcass characteristics

The increased performance of supplemented animals did impact carcass characteristics. Use of grain co-products produced heavier carcass weights and

Electronic gates allowed steers in all treatments to graze together and have access to the supplement assigned to them.

higher dressing percentages. Ribeye area, an indicator of overall carcass muscle mass, was larger for cattle receiving alfalfa and co-product supplements, primarily due to the heavier carcass weights.

Animals were harvested directly off pasture in 2005 and 2007. In 2006, the researchers checked the steers with ultrasound as they approached targeted weight and backfat endpoints. Most of the grain co-product steers met the targets and were harvested directly off pasture. The steers on the pasture-only and alfalfa pellet treatments needed additional time to attain the Select grade weight and marbling. Animals not meeting the targets were placed in a confinement barn and offered alfalfa haylage along with the supplements assigned to their group until they were harvested approximately 60 days later. At that point, carcass differences between treatments were minimal.

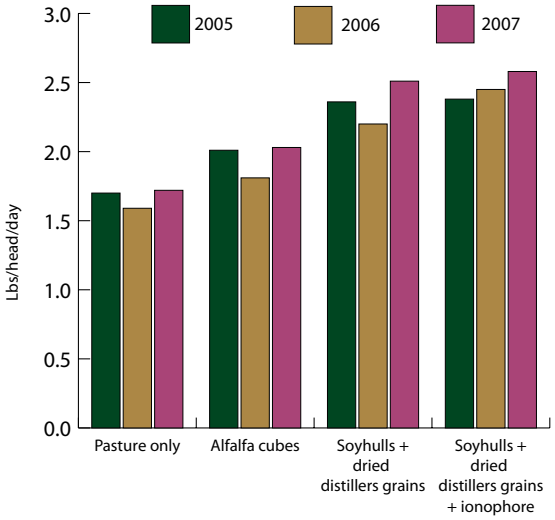
Warner-Bratzler shear force values, which indicate meat tenderness, were not found to be different among treatments. In addition, meat tenderness of these pasture-based steers was similar to that of ten other steers fed under conventional feedlot management practices and receiving the same amount of co-product supplement in 2005. This would further support the potential for producing acceptable beef with a grass or forage-based finishing system. Steers grazing pasture without any supplement produced beef that was of similar marbling as supplemented cattle. Only in 2007 was the average marbling score greater for the supplementation treatments compared with those from steers consuming just grass.

A dry growing season in 2005 resulted in the necessity to remove animals from pasture in early October. Subsequently, cattle did not have the degree of finish desired and this was reflected by the low percentage of cattle achieving the target quality grade. However, in 2006 and 2007 more than 70 percent of the carcasses from the supplementation treatments graded USDA Select, Choice or Prime.

Normande cross steers gain well

The Normande-influenced steers performed similarly to the crossbred beef steers. The Normande steers were on average a month younger, and therefore lighter, than the beef breed steers due to different calving seasons on the source farms in 2006 and 2007. Over all three years, the Normande carcasses had higher dressing percentages and less backfat than the beef breeds, as expected. While ribeye area was not different among the breed types, the conventional crossbred beef carcasses had higher marbling scores than the Normande. This was unexpected and may partially result from the lighter weight and younger age of the Normande cattle at slaughter. Normande cattle responded similarly to the beef crossbred steers to the different supplementation strategies.

Average daily gain of steers consuming different supplements in a pasture finishing system



The bottom line

Through the use of supplementation, it is possible to produce beef on pasture that will meet commodity market specifications. More time is required to meet these specifications when diets are strictly forage based. The cost of the additional dwell time for the forage-based steers is a trade-off with respect to the added cost of supplementation. But supplementation is a way to stretch pasture, especially during a summer slump in pasture growth. With growing consumer interest in grass-fed and -finished beef, some farmers may prefer not to supplement their cattle and sell their beef directly to customers or specialty markets rather than commodity markets. Dual-purpose Normande-influenced steers had daily gains similar to more conventional crossbred beef steers when managed in a pasture finishing system. These findings can help beef producers make better informed decisions related to alternative production systems.

For more information, contact:

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The Center for Integrated Agricultural Systems (CIAS) brings together university faculty, farmers, policy makers, and others to study relationships between farming practices, farm profitability, the environment, and rural vitality. Located in the College of Agricultural and Life Sciences at the UW-Madison, it fosters multidisciplinary inquiry and supports a range of research, curriculum development, and program development projects. For more information on the Center or on the research in this Brief, contact: **CIAS, 1535 Observatory Drive, UW-Madison, Madison, WI 53706 Phone: (608) 262-5200 Fax: (608) 265-3020 E-mail: ramcnair@wisc.edu, www.cias.wisc.edu**

This Research Brief is part of a series. Contact CIAS for other titles. CIAS staff members are grateful for the reviews of this research update by UW-Madison and UW-Extension faculty and CIAS Citizens Advisory Council members. Printed on recycled paper. September, 2008.

Attachment D: "Sward Characteristics of Beef Finishing Pasture" a 1996 presentation by Jim Gerrish, F. Martz and V. G. Tate

This paper was published in the Proceedings 1996 AFGC Annual Conference Vancouver BC, June 12-16, 1996.

SWARD CHARACTERISTICS OF BEEF FINISHING PASTURES

J.R. Gerrish, F.A. Martz, V.G. Tate[1]

Abstract

For cattle to successfully finish on pasture, abundant high-quality forage must be available to the grazing animals. Eighty-eight steers were finished on pasture with grain supplementation ranging from 0 to 75 % of the dietary energy supplied by grain. Pastures were intensively managed, cool-season, grass-legume pastures. Forage dry matter availability increased throughout the grazing season. The quality of the pastures also improved through the season, with crude protein (CP) content increasing and acid detergent fiber (ADF) content decreasing. Forage intake decreased at an average rate of 1 lb for each lb of grain fed. Observed average daily gains (ADG) were consistent with predicted ADG based on forage plus grain intake levels.

Introduction: To successfully finish cattle on pasture, forage quality must be high and forage availability maintained at adequate levels to ensure optimal intake. Blaser et al. (1977) suggest that energy intake will limit performance of ruminants grazing cool-season forages before protein or other nutrients. Energy content of perennial cool-season forages is most affected by maturity of the plant. Management of high energy potential pastures must focus on maintaining plants in a high quality, vegetative state. In this research we examined trends in forage availability, pasture quality, and voluntary forage intake.

Materials and Methods: A pasture-based, beef finishing project was conducted at the University of Missouri - Forage Systems Research Center in north-central Missouri in 1995. Eighty-eight steers were assigned to four grain feeding levels on pasture with each treatment replicated twice. Grain feeding levels were expressed as the percent of their total dietary energy intake supplied by grain and were 0, 25, 50 and 75 % with the remaining nutrients supplied by pasture. The pasture with steers receiving no grain was stocked at 1.0 steer to the acre. The pasture with steers receiving 25 % of their energy from grain was stocked at 1.25 steers per acre. The pasture with steers receiving 50 % of their energy from grain was stocked at 1.5 steers per acre. The pasture with steers receiving 75 % of their energy from grain was stocked at 1.75 steers per acre (Table 1).

During the first phase of the experiment, April 22 to August 22, the supplement was cracked corn. During the second phase, August 23 to October 30, the supplement contained 70 % cracked corn and 30 % corn gluten feed.

Each treatment consisted of 8 acres which were divided into six permanent paddocks (Fig 1). During the grazing season, these were further divided with temporary fences and animals were

allowed to back graze the paddock in order to access the water supply. Each subdivision within a paddock provided the animals with 1 to 3 days of feed depending on the season. Rest periods ranged from 10 to 35 days depending upon season and subdivision within paddock. Pastures were clipped for seedhead control in early June after cool-season grasses had headed.

Table 1. Supplementation level, stocking rate, and number of steers per treatment group in pasture-based finishing study.

Supplementation level	Stocking rate	Number of steers
% of diet	steers/acre	no.
0	1.00	8
25	1.25	10
50	1.50	12
75	1.75	14

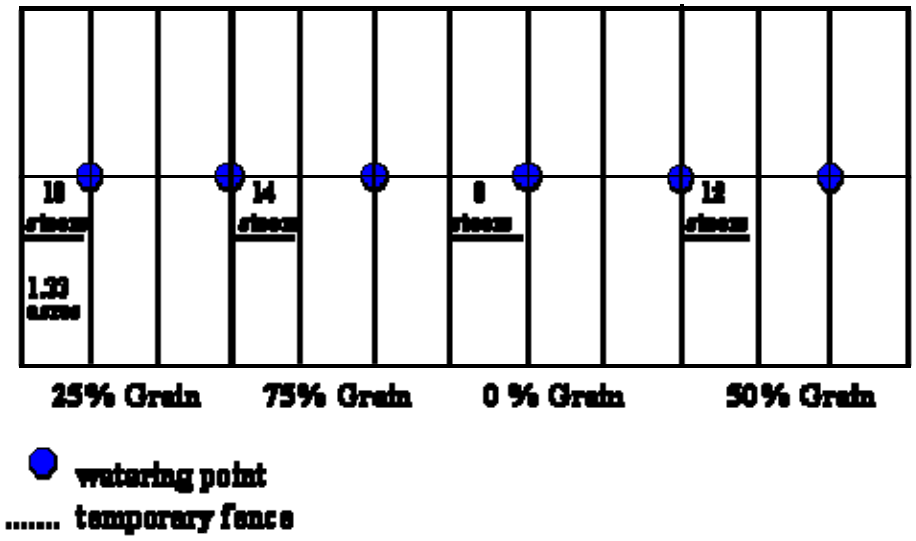

Figure 1. Schematic outline of one replication of beef-finishing pastures.

Within each treatment, individual paddocks were gridded into 900 ft2 blocks for pasture sampling purposed. Prior to the allocation of a new grazing strip, one 2.7 ft2 quadrat was cut from each grid block in that pasture allocation strip. Samples were oven dried and CP, ADF, and neutral detergent fiber (NDF) were determined using near infra-red reflectance spectroscopy. Forage samples were collected from May 16 to October 18, 1995. Species composition data were collected from these paddocks as well. Forage dry matter intake (DMI) was calculated by the difference method using quadrats clipped prior to and immediately following grazing of an individual paddock.

Results and Discussion: Forage quality of these cool-season grass-legume pastures increased during the season, with CP increasing and ADF decreasing. Crude protein was not limiting for the animals at any time during the grazing season. Crude protein requirement for medium-framed 700-pound steers gaining 2.0 lb/day is approximately 10%, according to the National Research Council (1984). Crude protein levels of the forage exceeded this requirement throughout the season (Fig. 2). This result is in concurrence with the claims of Blaser et al. (1977) that protein would not limit performance on cool-season pastures. Linear regression was used to determine trend in forage quality through the season using day of year as the independent variable. For CP the relationship of CP to day of year was significant (P=.05) for the 0%- and the 75%- grain groups and a strong trend held true for the 25% and 50% groups (P<.10). For ADF the relationship to day of year was also significant (P=.05) for the 0%- and 75%- grain levels, and again the strong trend held true for the 25% and 50% groups. Cool-season pastures are often cited as being low quality during the summer months. Results of this research indicate that cool-season pastures managed to maintain vegetative forage are quite high quality even through the summer months.

Forage dry matter availability also increased during the season. Accurate forage sampling was hampered in the early part of the season due to extremely wet weather so forage availability data is presented for only Phase II. Forage intake by grazing animals during the Phase I period also appeared to be depressed due to heat stress and excessive rainfall. Rainfall during the Phase I period was 18 in. above normal for the research location. Phase II forage availability at turn-in and daily forage intake are in Table 1. The observed intake indicates that the steers in the 0 grain treatment were consuming adequate forage dry matter to maintain the expected ADG of 2.0 pounds per day.

A concern about feeding high levels of grain on pasture is the substitution of grain intake for forage intake. Based on the intake data in Table 2, it appears that the first increment of grain fed has the greatest negative impact on forage intake. The substitution coefficients for 25-, 50-, and 75%-grain feeding levels were 1.26, 1.00, and .74, respectively. Steer performance in this study as reported by Martz et al. (1996) indicates very little difference in ADG between the 0- and 25%-grain groups. The lack of response to grain supplementation at the 25% level may be the result of decreased forage intake in the presence of added grain in a quantity that was high enough to affect rumen performance but not high enough to increase ADG. Average forage availability was very similar between the 0- and 25%-grain supplemented pastures, suggesting that forage availability was probably not limiting intake. Mean forage availability in the 50- and 75%- grain supplemented pastures was significantly lower than the 0 and 25% grain pastures. As the steers receiving higher levels of supplementation increased body weight, their forage consumption in terms of pounds of dry matter per head likely increased more rapidly than the steers growing at a slower rate. More forage was, therefore, consumed in each grazing cycle and the residual following grazing was reduced. The lower residual dry matter resulted in slower regrowth and lower dry matter yield at turn-in on each subsequent grazing cycle. The availability was low enough that forage intake may have been limited on these pastures explaining why steer performance on the 75%-grain pastures was not as high as what would have been predicted.

In summary, forage quality tended to increase throughout the grazing season on all treatments. Forage availability at the beginning of each rotation remained near constant or slightly increased

for the 0- and 25%-grain groups while availability tended to decrease slightly through the season for the steers receiving 50 and 75% grain levels. It appears that forage availability was more likely to limit steer performance than would forage quality on these mixed cool- season grass-legume pastures.

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Table 2. Forage dry matter availability and voluntary dry matter intake of steers grazing pasture at four levels of grain supplementation.

Grain supplementation level	Available dry matter at turn-in	Voluntary forage intake
% of diet	-- lb/A --	- lb/hd/day -
0	2659	21.5
25	2583	12.7
50	1983	9.6
75	2161	8.2

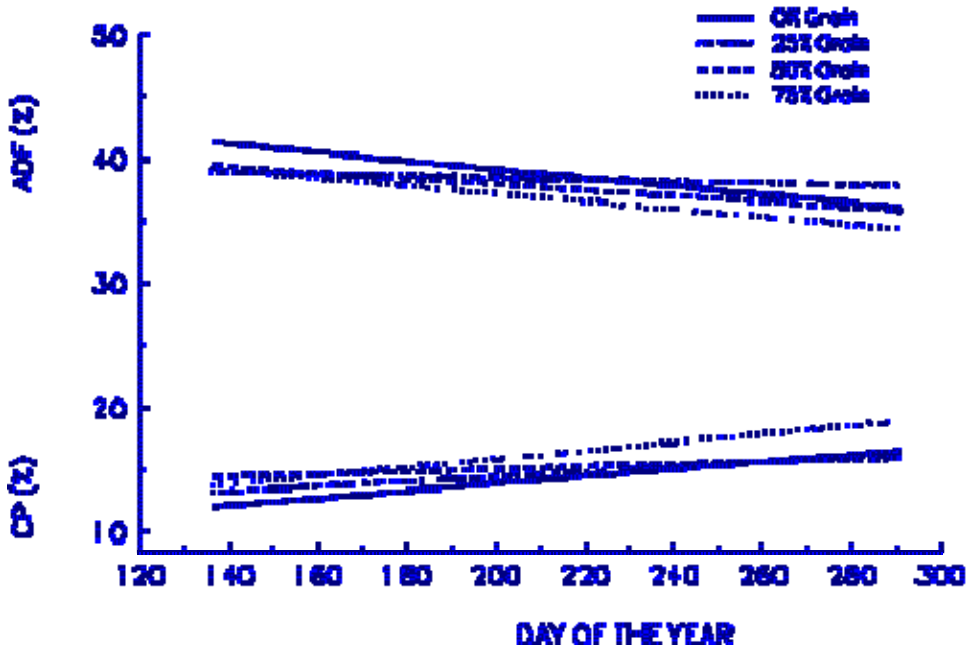

Figure 2. Trend in forage acid detergent fiber (ADF) and crude protein (CP) in cool-season, grass-legume pastures across the grazing season.

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Attachment E: FOOD Farmers report on measuring Dry matter

Report from the ad hoc committee to clarify the measurement of pasture consumption

NODPA convened a committee to compile practical ideas on measuring dry matter intake that could be applied consistently across the country.
The committee was chaired by the newly appointed head of Organic Dairy Development & Research at the University of New Hampshire Organic Research Farm, Kevin Brussell and included Kathy Soder (USDA ARS), Kathie Arnold (NODPA Board member), Arden Nelson (WODPA Board member), Lisa McCrory (NOFA VT), Jim Gardiner (NODPA Board member), Juan Velez (Aurora Organic Dairy) and Ed Maltby, NODPA Executive Director.
August 13, 2007

Report Title: Thought for the day: Eat more pasture- do less work

Access to Pasture standards

1. Organic dairy livestock over 6 months of age must graze on pasture during the months of the year when pasture can provide edible forage.
2. The grazed feed must provide significant intake for all milking-age organic dairy cows. At a minimum, an average of 30% of the dry matter intake each year must come from grazed pasture during the region's growing season, which will be no less than 120 days per year.
3. Temporary exemption from pasture may be allowed because of:
    a. Conditions under which the health, safety, or well-being of the animal could be jeopardized, including to restore the health of an individual animal or to prevent the spread of disease from an infected animal to other animals.
    b. Short term inclement weather.
    c. Temporary conditions which pose a risk to soil and water quality.
    d. In no case will temporary confinement and exemption from this pasture standard be allowed as a continuous production system.

The consensus of the group was that the estimation of the consumption of dry matter from grazed pasture will be made looking at the average dry matter intake from grazing for the lactating herd each year.
The following is to try to answer some of the questions and concerns that have been raised, providing guidance for the certifier and producer in how they might measure the consumption of dry matter from grazing.

1. Will a producer get de-certified with one year at 25% DM consumption?
    a. The measurements can not be that precise and are an accumulation of many different calculations including: pasture logs; daily record of TMR provided; tracking refused TMR; weather; time of calving.
    b. Every farm is different and precipitation may vary greatly over short distances
    c. The whole farm plan should be geared to a goal of easily meeting the 30% minimum with sufficient margin for usual weather variances;
    d. As with other situations within the organic certification, the inspector will be looking at many different aspects of production and management to assess the reasonableness of the farm achieving an average minimum of 30% which will determine the level of warning and censure for a one year below an average minimum of 30%.

2. Would there be any situation where an irrigated pasture in an arid climate be allowed an exemption based on "inclement weather"?
    a. The source of the irrigation (snow or catchment area) can be subject to weather changes:
        1. For ditch irrigation there is third party data available to show yearly variance in availability.

2. For center pivot or other irrigation there may be limited third party information but good management would record water usage.

b. Climatic data for different regions is easily available over the internet and regional information can be used to assess if weather conditions were a factor in poor quality pasture.
c. It takes longer to establish a productive, balanced pasture in arid areas which make the establishment more susceptible to weather changes. This extended timeline would need to be included within the whole farm plan and realistically appraised with the initial certification. In order to meet the requirement, cow numbers will likely need to be initially adjusted downward from final planned herd size if a new operation does not have already established pasture.

3. What is the role of management?
    a. A realistic appraisal of the number of cows the pasture can support.
    b. Layout of farm to maximize access to pasture.
    c. Seeding of annual forage crops as a balance for extremes of weather or as a permanent rotation to recognize repeated weather patterns.
    d. Good record keeping to build an accurate picture of the productivity of the pasture to be able to do forward budgeting and to adjust cow numbers, calving pattern or other controllable areas.

4. Is there enough understanding of calculating dry matter and testing of feed by producers?
    a. It is only critical when the producer starts to be within 10% of the average minimum of 30% over a year's grazing season(s), probably most that do it on an "as-fed" base would be above this level.
    b. A work sheet has been developed that will assist producers in calculating and recording the feed consumed by their dairy herd.
    c. Information is attached on how to calculate dry matter and other factors affecting consumption of feed.
    d. The certifier would have cause to require testing of feed for volume (i.e. weight of bales) and dry matter from any producer who came close to the 30% minimum rather than requiring them from every producer.

5. Should allowance be made for micro-variations such as the increased energy used when cows have to walk further, stress from being in heat, housed because of veterinary needs?
    a. The words "average" and "minimum" when applied to a whole herd of lactating cows over the grazing season(s) during a calendar year gives enough room for these small day to day variances.
    b. If these small variances affect achieving the **minimum,** the producer should be looking at management and changes to the pasture system to determine how s/he can easily reach the average of 30%.

Attachment:
1. Feed Calculation worksheet (legal size)
2. Dry Matter calculation and Walking Energy requirements by Kathy Soder, USDA ERS
3. Pasture consumption calculation by Lisa McCrory

Farm and/or Group Name **Month _____** **Year_____**

Please use a separate sheet for each group or herd of cows

Is the Calculation of feed fed on an As Fed or Dry Matter basis? Please circle one. **As Fed** **DM**

Columns marked with an * are optional

	Stored Feeds Record								Pasture Record						Production Record*			
Day	lbs of grain /cow	lbs of forage #1 or No. of bales/cow or group	lbs of forage #2 or No. of bales/cow or group	lbs of forage #3 or No. of bales/cow or group	No. of cows worth of TMR mixed/ fed	No. of cows fed TMR or in group	lbs. of refusal/cow or group *	Ref to notes below	Paddock ID-AM	Paddock ID -PM	Hills? Yes or No *	Dist. to pasture in feet *	Pasture Quality Estimate - (5 high quality-1 poor quality) *	Weather - suitability for grazing - (5 high - 1 low) *	No. of cows in tank*	lbs of milk in tank*	lbs of milk/ day *	lbs of milk /cow/day *
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		
16																		

Notes on changes in grain, forage and/or TMR correlated to a designated number in the above column on "ref to notes below"

1

2

3

4

5

6

Farm or group name **Month** **Year _____**

Please use a separate sheet for each group or herd of cows

Is the Calculation of feed fed on an As Fed or Dry Matter basis? Please circle one. **As Fed** **DM**

Columns marked with an * are optional

	Stored Feeds Record								Pasture Record						Production Record*			
Day	lbs of grain /cow	lbs of forage #1 or No. of bales/cow or group	lbs of forage #2 or No. of bales/cow or group	lbs of forage #3 or No. of bales/cow or group	No. of cows worth of TMR mixed/ fed	No. of cows fed TMR or in group	lbs. of refusal/cow or group *	Ref to notes below	Paddock ID-AM	Paddock ID -PM	Hills? Yes or No *	Dist. to pasture in feet *	Pasture Quality Estimate - (5 high quality-1 poor quality) *	Weather - suitability for grazing - (5 high - 1 low) *	No. of cows in tank*	lbs of milk in tank*	lbs of milk/ day *	lbs of milk /cow/day *
17																		
18																		
19																		
20																		
21																		
22																		
23																		
24																		
25																		
26																		
27																		
28																		
29																		
30																		
31																		

Notes on changes in grain, forage and/or TMR correlated to a designated number in the above column on "ref to notes below"

1

2

3

4

5

6

Calculating Dry Matter

Importance of Dry Matter Content

Dry matter intake (DMI) is defined as the amount of feed a cow consumes after the water has been removed. While many farmers are used to dealing with feed in its 'As Fed' form (as it comes out of the silo, pasture, or bin, with the water in it), cows are consuming nutrients, not pounds of feed, and these nutrients must be calculated as DM, for an accurate estimate of nutrient intake. Comparison of feeds on a DM basis allows feeds to be compared on an equal moisture-free basis (for example, if comparing the nutritive value of grass silage vs. grass hay).

***NOTE:* <u>Forage analysis</u> results will always be more accurate than book values for DM content. If at all possible, use actual DM values, particularly for fresh and ensiled feeds, which can be quite variable. Use of incorrect book values could result in *overestimating pasture intake*, potentially not meeting the 30% minimum DMI requirement. Additionally, using incorrect DM values can result in other problems associated with imbalanced rations, including *decreased milk production* and *impaired cow health*.**

Calculating Dry Matter from 'As Fed' Values

To calculate the amount of DM from the known 'As Fed' amount and DM %:

Example: 20 lb. of hay 'As Fed' which is 90% DM (based on forage analysis) is fed to a cow.

How many lb. of DM did you feed?

20 lb. x 0.90 = 18.0 lb. of DM

NOTE: The DM percentage (in this example, 90%) must be divided by 100 (90 ÷ 100= 0.90)

NOTE: Always remember that the DM value will be *smaller* than the 'As Fed' value because the water content was removed.

Calculating 'As Fed' from DM Values

Example: Your ration calls for feeding 10 lb. DM of hay (with a known 90% DM content) to each cow. How many lb. is that on an 'As Fed' basis?

10 lb. ÷ 0.90 = 11.1 lb. of hay 'As Fed'

NOTE: Always remember that the 'As Fed' value will be *larger* than the DM value because the water content was "added" back in, as it would be weighed on a farm scale.

What if DM is Estimated Incorrectly? (Example)

We have 1000 lb. cows producing 45 lb. of milk that will consume approximately 35 lb. of total DM (from pasture and stored feeds) per cow per day.

We want to feed a very simplistic ration consisting of:

60% DMI from grass silage
10% DMI from grass hay
30% DMI from pasture.

Using book values, we estimate DM of the silage as 28% and the hay as 90% DM.

Silage

DM = 0.60 x 35 lb. total DMI = 21 lb. DMI from silage
'As Fed' = 21 lb. DM ÷ 0.28 = 75 lb. silage 'As Fed'

Hay

DM = 0.10 x 35 lb. total DMI = 3.5 lb. DMI from hay
'As Fed' = 3.5 lb. DM ÷ 0.90 = 3.9 lb. hay 'As Fed'

By difference, pasture DMI = (35 total DMI – 21 lb. DM silage– 3.5 lb. DM hay) = 10.5 lb.DMI from pasture

(10.5 lb. DM from pasture ÷ 35 lb. total DMI) x 100 = 30% total DMI from pasture.

We later obtain a *forage analysis*, where the silage DM is actually 35%.

If we're feeding 75 lb. 'As Fed' silage based on our previous calculations, how many lb. of actual DM are we feeding?

75 lb. x 0.35 = 26.3 lb. of DM *actually* consumed from silage. **(75% of total DMI)**

This means that the cows are obtaining 5.3 lb. more DM from silage (26.3 – 21.0) than we first estimated, or, 5.3 lb. ***less*** pasture DMI than first estimated. What does this do in relation to the pasture intake organic standard?

((Silage DMI + Hay DMI) ÷ Total DMI) x 100 = % DMI from stored feeds

((26.3lb. + 3.5 lb.) ÷ 35 lb.) x 100 = 85% total DMI from stored feeds

100% total DMI - 85% DMI from stored feeds = 15% DMI from pasture

Pasture DMI was *grossly overestimated* using book values, and, based on the proposed organic pasture standards, this farm would not be meeting the minimum 30% pasture DMI guidelines.

Table 1. Average book values for DM% of commonly fed dairy feeds (Adapted from NRC, 2001; Dairy Reference Manual, 1995).

Feed	DM (%)*
Cool-season grass pasture	18-28
Legume pasture	18-28
Silage (grass, corn)	28-40
Hay (grass, legume)	90
Barley, Wheat	89
Corn, dry	88
Corn, high moisture	74
Soybean meal, 48%	90

* Values will vary widely, particularly with ensiled and fresh feeds. Use forage analysis results when possible.

Energy Requirements of Grazing Activity

The amount of energy Net Energy for Lactation (NE_L) required for grazing activity is listed below in Table 1. Grazing activity is a function of body weight (BW), distance walked between pasture and parlor, and topography of the pasture. The equations used to calculate these values assume that dry matter intake (DM) is 'normal' for the given body weight and that pasture is 60% of the total DMI.

Table 1. Estimated NE_L requirements (Mcal/day) associated with grazing flat or hilly ground for an average Jersey cow (1000 lbs) and an average Holstein cow (1400 lbs). Adapted from NRC (2001).

Total distance, parlor	BW = 1000		BW = 1400	
to paddock, miles/day	'Flat'	'Hilly	'Flat'	'Hilly
0.25	0.63	3.33	0.88	4.66
0.50	0.71	3.41	0.99	4.77
0.75	0.79	3.49	1.11	4.89
1.00	0.88	3.58	1.23	5.01
1.25	0.96	3.66	1.34	5.12
1.50	1.04	3.74	1.46	5.24
1.75	1.12	3.82	1.57	5.35
2.00	1.21	3.91	1.69	5.47

High-quality pastures (cool-season grasses or legumes) typically contain **0.69 – 0.72 Mcal/lb of DM.

Approximately 0.31 Mcal NE_L is required for each pound of 3.5% milk produced (or 0.33 Mcal for 4.0% milk). Therefore, if we assume that DMI and nutrient intake remains the same (which it may or may not), a 1000 lb. cow that has to walk on flat ground 2 miles/day may drop in milk by 2-4 lb. in milk (1.21/0.31).

A 1400 lb. cow walking on hilly ground 2 miles per day may drop in milk production by more than 10 lb./day (5.47/ 0.31 = 17.6 lb of milk lost) if additional energy (or DMI) does not make up the difference for this increased activity.

Measuring 30% DM from Pasture
By Lisa McCrory

Current USDA National Organic Program Regulations require access to pasture for all ruminant animals [§205.237, §205.239] (*see end of article for exact wording).* USDA Accredited certifiers have been enforcing this standard since the inception of the program in 2002. The current rule, however, lacks measurable standards and has led the USDA /NOP to say that the current standard is unenforceable and as a result, organic dairy farms are not being treated equally. Producers and consumers alike have not been happy about the lack of enforceable standards. Knowing that there are organic dairies selling milk as organic and *not* using pasture sends a confusing message to consumers and threatens the health and potential growth of the organic dairy industry.

In April 2006, USDA/NOP invited producers, certifiers, resource individuals and industry representatives to participate in a pasture symposium. This meeting was intended to assist the USDA/NOP in understanding the importance of pasture on organic farms and to develop standards for pasture that were reasonable and enforceable within an organic system plan.

At that meeting, the majority of the certifiers and farmers agreed that specific and quantifiable pasture standards were necessary and could easily be documented using current record-keeping regimes of certified organic livestock farmers. The following standard has been approved by producer organizations, advocacy groups, processors and certifiers throughout the United States: *"Ruminant livestock must graze pasture for the growing season but not less than 120 days per year. The grazed pasture must provide a significant portion of the total feed requirement but not less than 30% of the dry matter intake on an average daily basis during the growing season." This wording was also voted on and approved by the NOSB in 2005 as a guidance document for certifiers.*

Because a measurable higher standard has not yet been adopted by the NOP, Organic Valley/CROPP has developed higher standards, which were voted and approved by their producer members. Organic Valley is now requiring that the producer's farm plan includes a provision that "ruminant animals over 6 months of age receive a … minimum of 30% of their dry matter intake from pasture for a minimum of 120 days per year".

In anticipation of a measurable pasture standard, Vermont Organic Farmers (VOF), the certification arm of NOFA-VT, and NOFA-NY Certified Organic LLC have included a section in their application forms that allows a producer to evaluate their pasture use. These forms help the certifier and the producer determine if the NOSB recommendation of 30% dry matter and 120 days is being met. If a producer is not meeting the 30% minimum requirement, they are asked to justify their management and in some cases to increase their pasture acreage.

Other Northeast certifiers (MOFGA Certification Services LLC, Baystate Certifiers, and Pennsylvania Certified Organic) do not provide any record keeping forms that evaluate dry matter intake from pasture at this time. Don Franczyk of Bay State Certifiers said that they are taking the 'wait and see' approach; when the NOP presents their proposed standard, they will move forward with the necessary paperwork for documentation. At this time, Bay State Certifiers has 6 certified dairies in Massachusetts and Connecticut, 4 of which are practically 100% grass-fed. MOFGA Certification Services and PCO work with their producers if they see that the producer is clearly limited in pasture for the size of their herd. They make it clear that if the NOP rule implements measurable pasture requirements, their continued certification may be in jeopardy. When writing non-compliance notices to producers, MOFGA Certification Services cites the definition for pasture included in the rule which states that "pasture must provide food value and that

natural resources must be maintained or improved". Certifiers have a long history with using feed calculations to red-flag potential compliance issues. For example, the 80/20 feed exemption, when calculated on an as fed basis, was based on certain assumptions about the weight of hay bales. It is also a requirement for producers to provide information on feed harvested for each production year. Certifiers must be aware that a margin of error exists in all of these calculations and realize that their best use is determining which producers need additional evaluation.

Producers are required, by any certifier, to submit an Organic Farm Plan that demonstrates how they are building soil fertility, preventing soil degradation/erosion, a description of their out-door access practices, and where their feed is coming from. From these requirements, a system is already in place to calculate intake from pasture. Pasture intake information can be determined by 'back-calculation' or by providing a ration plan for the herd during the grazing months.

To back-calculate, one compares what is fed in winter, to what is fed in the summer. The total dry matter is determined from both rations; then the summer ration is subtracted from the winter ration. The difference between those two rations would be the amount being provided from pasture. Divide the dry matter value of the pasture into the dry matter value of the winter ration and you will get your pasture %.

Example:
100 milking cows weighing an average of 1100 each. Average milk production per cow is 50 lbs/cow.

Winter ration:
50 # Haylage (40% dry matter) = 20 lbs dry matter
5 # dry hay (90% dry matter) = 4.5 lbs dry matter
15 # grain (90% dry matter) = 13.5 lbs dry matter
Total Dry Matter = 38 lbs
Summer ration:
12 # grain (90% dry matter) = 10.8 lbs dry matter
4 # dry hay (90% dry matter) = 3.6 lbs dry matter
Total Dry Matter = 14.4 lbs

Winter Ration (38) – Summer Ration (14.4) = 23.6 lbs dry matter remaining = pasture portion of the ration
To determine the % Dry Matter from Pasture: 23.6 divided by 38 = 62% of the daily ration = pasture.

To calculate the ration based upon the dry matter needs of your cows, you can also forward calculate. Dairy cattle consume approximately 3.5 % of their body weight in dry matter intake daily. Total dry matter intake can vary slightly based upon the breed and the total pounds of milk produced, but these average values will help producers and certifiers identify those farms that are close to the minimum allowances.

Example 1: a herd of 100 Jerseys weighing an average of 950 lbs each. They each need approximately 33.25 lbs dry matter per cow per day (950 x .035 = 33.25 lbs). The cows are fed 12# of grain per day (90% dry matter) and 4 # of dry hay (90% dry matter) per day to complement their pasture.

Expected dry matter intake per cow:	33.25 lbs
- minus dry matter intake from grain	-10.8 lbs
- minus dry matter intake from hay	- 3.6
Total dry matter from pasture =	18.85 lbs

To determine the % dry matter from pasture: 18.85 divided by 33.25 = 57% of the daily ration = pasture

For those producers who still like to supplement their pasture with a TMR ration, here is another calculation.

Example 2: a herd of 60 cows weighing an average of 1300 lbs. They each need approximately 45.5 lbs of dry matter per day (1300 x .035 = 45.5 lbs). The cows are fed a TMR ration that includes 40 lbs of haylage/corn silage (40% dry matter) and 14 lbs of grain (90% dry matter).

Expected dry matter intake per cow: 45.5 lbs
-minus dry matter intake from grain -12.6
-minus dry matter intake from silage - 16.0
Total dry matter from pasture = 16.9 lbs

To determine the % dry matter from pasture: 16.9 divided by 45.5 = 37% of the daily ration = pasture

Whether or not your certifier or processor is asking you for a pasture dry matter calculation, I recommend you work on making these determinations for your farm. Work with your nutritionist, ask your local Extension agent to help you, or contact your local organic dairy technical outreach person available through MOFGA, NOFA-VT, NOFA-NY, PCO, NOFA-Mass and NOFA-NH. It is best to know where you stand now so that you can start planning for any adjustments that may need to be implemented within the next year or so (optimistic, aren't I?). I am sure most dairy graziers will find that they are well over the 30% minimum standard, so don't be intimidated by doing the calculations for your farm; I am sure you will be pleasantly surprised.

CURRENT REGULATION AND DEFINITION:

Definition of pasture as written by the NOP in the definition section of the rule: Land used for livestock grazing that is managed to provide feed value and maintain or improve soil, water, and vegetative resources.

205.238 Livestock Health Care Standards

(a)(3) Establishment of appropriate housing, pasture conditions, and sanitation practices to minimize the occurrence and spread of diseases and parasites;

§ 205.237 Livestock feed. --

The producer of an organic livestock operation must provide livestock with a total feed ration composed of agricultural products, including pasture and forage, that are organically produced and, if applicable, organically handled:

§ 205.239 Livestock living conditions.

(a) The producer of an organic livestock operation must establish and maintain livestock living conditions which accommodate the health and natural behavior of animals, including:
(1) Access to the outdoors, shade, shelter, exercise areas, fresh air, and direct sunlight suitable to the species, its stage of production, the climate, and the environment;
(2) Access to pasture for ruminants;

Lisa McCrory works for NOFA-VT as a Dairy and Livestock Technical Advisor and operates Earthwise Farm and Forest in Bethel, VT

Attachment F:

FOR IMMEDIATE RELEASE
April 12, 2006

CONTACT: Urvashi Rangan [CU], 914-378-2211 (work) or 646-594-0212 (cell);
Charles Margulis [CFS], 510-697-0615 (cell) or 415-826-2770 (work)

New Surveys Project Drop in Organic Milk Market If Federal Agency Fails to Fix Pasture Standards

Upcoming USDA hearing of farmers, producers and retailers April 18-19 in State College, PA

Washington DC—A week before the United States Department of Agriculture (USDA) gets ready to hold a hearing on the issue, national surveys from The Center for Food Safety and Consumers Union (CU) project a significant drop in the organic milk market if consumers knew that the cows the milk came from were confined indoors and did not graze for most of their lives on pastured land. Under the existing USDA enforcement policy, producers of organic milk are not clearly required to raise their organic cows on pasture. The lack of a stringent enforcement standard has led to complaints that industrial-style confined, dairy feedlots are selling milk under the organic label.

"Because the Department of Agriculture has not clearly defined what it means for an organic dairy cow to have access to grass, some consumers are being seriously misled and buying milk that doesn't meet their expectations. They are paying a premium price believing that the cow their milk came from spent most of its life outdoors, which is healthier and more sustainable than being confined in a crowded space. But under USDA's current practices, consumers may not be getting what they are paying for," says Dr. Urvashi Rangan, Senior Scientist & Policy Analyst for Consumers Union, the nonprofit publisher of *Consumer Reports*.

"The results of the debate in State College next week not only affect consumers but all organic milk producers who want their customers to have confidence in the quality of the products they are buying. The surveys show that confidence would be severely eroded," adds Rangan.

Highlights of two nationally representative and independent surveys include:

- A survey of 1,011 of U.S. adults commissioned by the Center for Food Safety found that six out of ten women who buy organic milk and five out of ten of all organic milk purchasers would no longer do so if they knew that many organic cows were confined to fenced-in feedlots and did not graze on pasture for most of their lives.

- More than two-thirds of all consumers and 75% of women in the Consumers Union (CU) survey of 1,485 U.S. online adults said that the national organic standards should require that animals graze outdoors.
- When asked specifically in the CU survey if they would still pay a premium price for organic milk that came from cows that were confined indoors and did not graze outdoors (have access to pasture), only 14% agreed that they would (60% disagreed, while 25% remained neutral).

"These polls give a clear indication of consumer sentiment towards organic milk — they want and expect organic dairy cows to be raised on pasture before organic milk ends up on the grocery store shelf," said Joseph Mendelson, Legal Director for the Center for Food Safety.

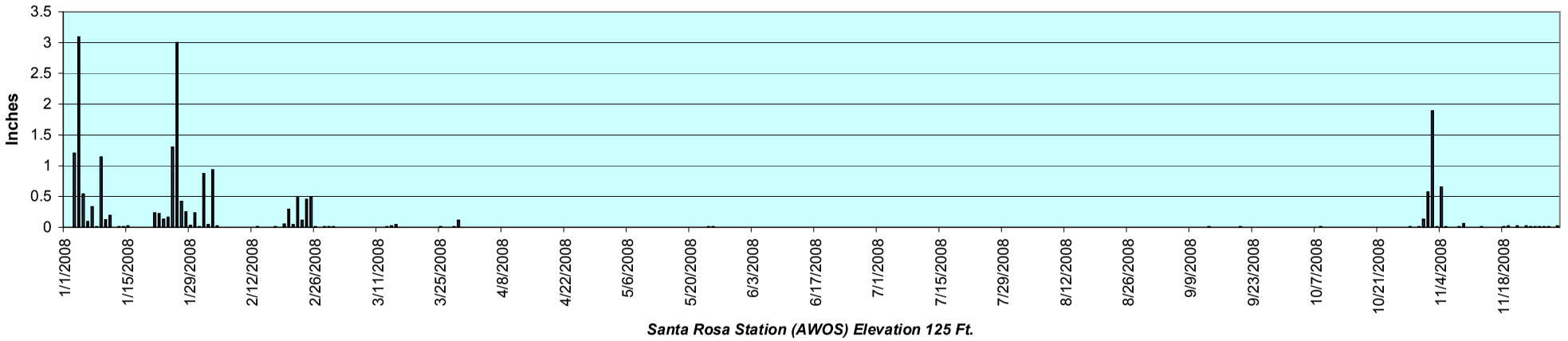
"We want the USDA and organic dairy companies to listen to consumer demand and require organic milk to come only from cows raised for a significant period time on pasture. Consumers will reject organic milk if they believe that organic is no different from factory farm milk, and that would hurt the entire organic market," Mendelson continued.

-30-

Attachment G: Precipitation graphs for Santa Rosa (CA) from 2005 to 2008

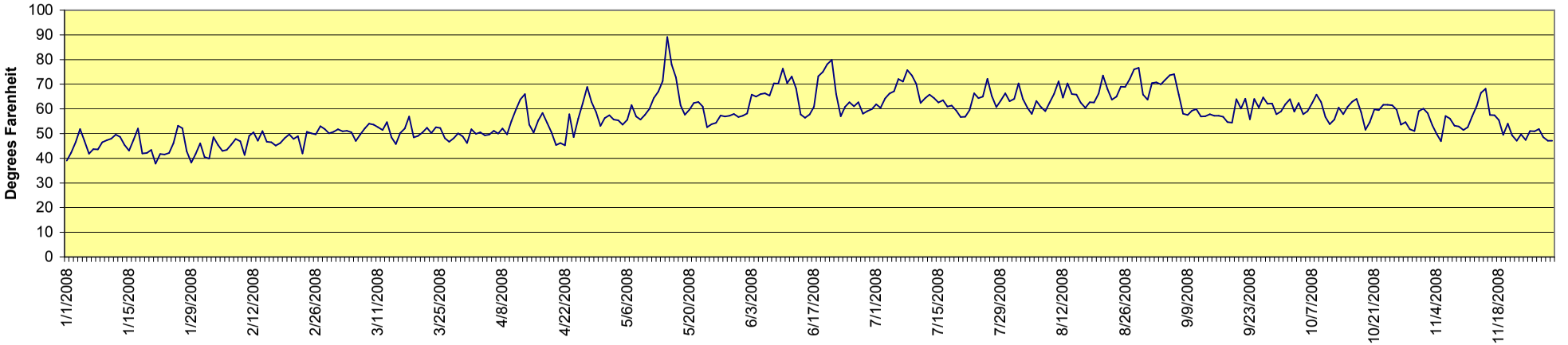
2008

Precipitation by Day

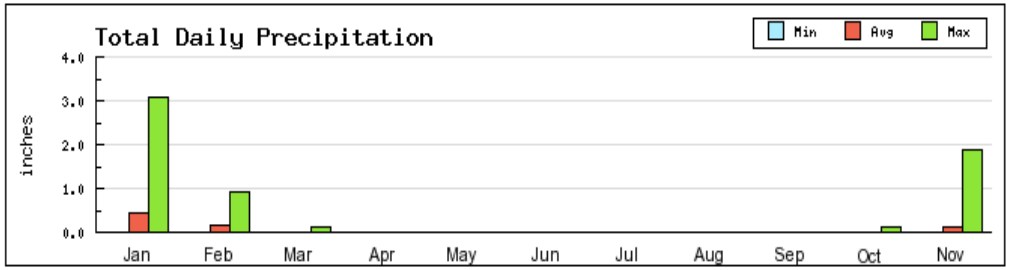


Santa Rosa Station (AWOS) Elevation 125 Ft.

Average Temperature by Day



Summary by Month



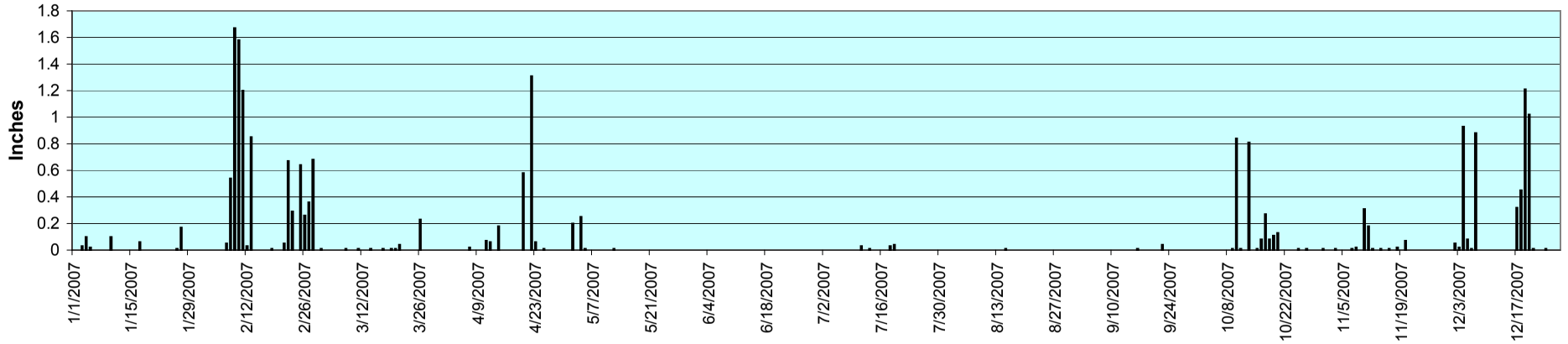
Annual Averages

Temperature		Search Summary	
Coldest Temperature:	26.1°F	Start Date:	Jan 1, 2008
Average Daily Temperature:	57.1°F	End Date:	Nov 30, 2008
Hottest Temperature:	102.9°F	Number of Years:	1
Conditions		Number of Days:	335 days
Average Daily Precipitation:	0.06 IN	Results Summary	
Average Visibility:	8.6 MI	Days in Database:	335 days
Average Daily Wind Speed:	4.66 MPH	Missing Days:	0 days
Average Sea Level Pressure:	29.99 IN		

(Weather data from the National Climatic Data Center - Global Surface Summary of Day)

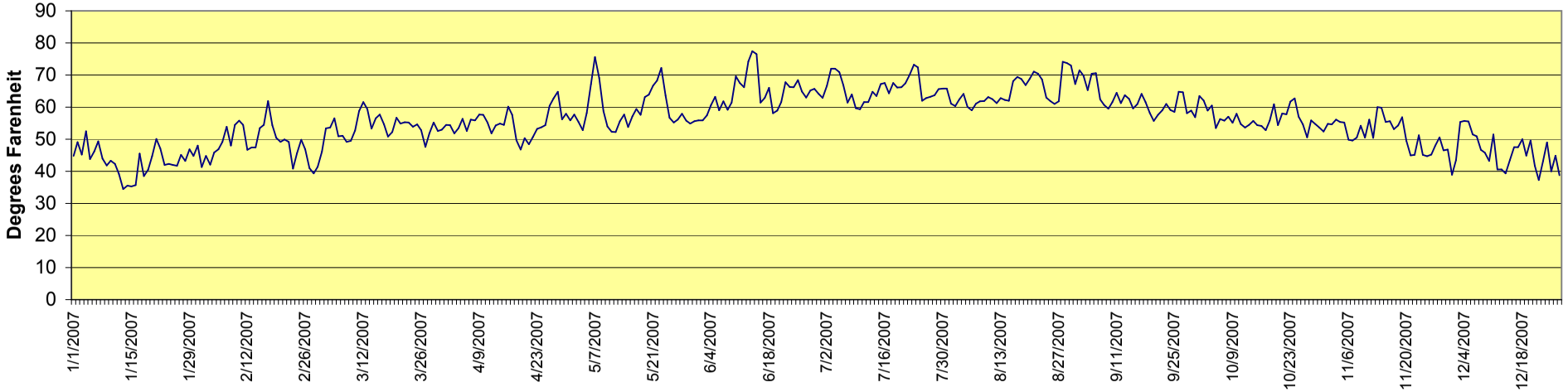
2007

Precipitation by Day

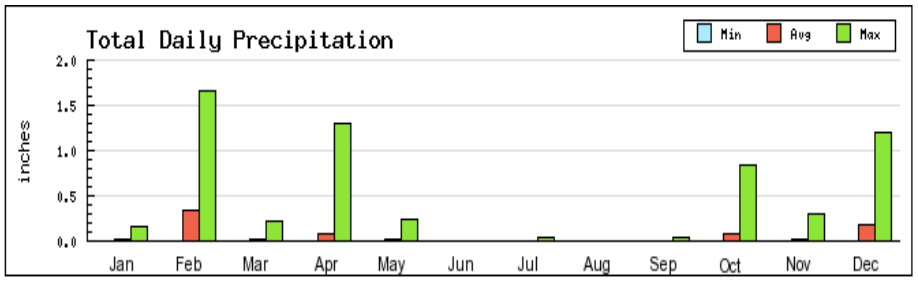


Santa Rosa Station (AWOS) Elevation 125 Ft.

Average Temperature by Day



Summary by Month



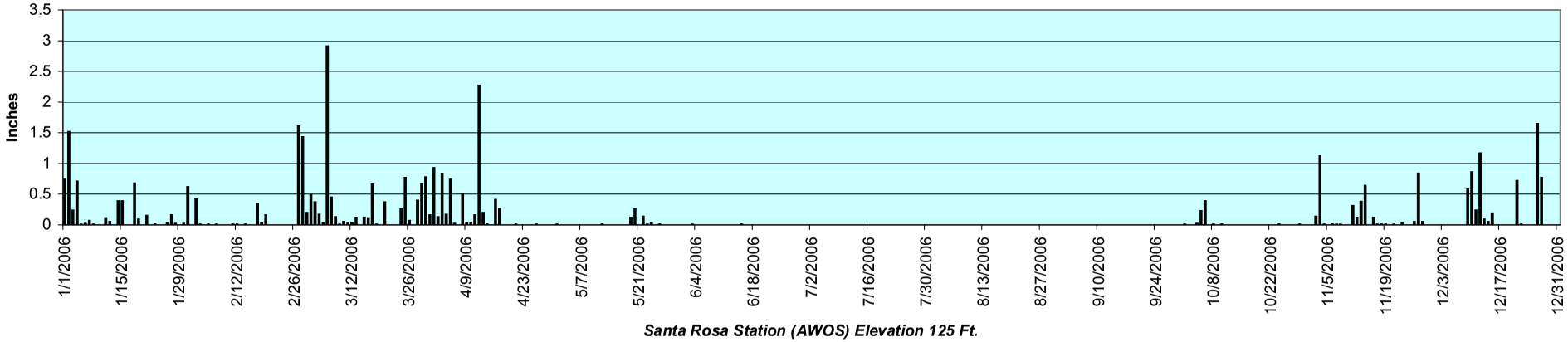
Annual Averages

Temperature		Search Summary	
Coldest Temperature:	19.9°F	Start Date:	Jan 1, 2007
Average Daily Temperature:	56.0°F	End Date:	Dec 31, 2007
Hottest Temperature:	100.4°F	Number of Years:	1
Conditions		Number of Days:	365 days
Average Daily Precipitation:	0.06 IN	Results Summary	
Average Visibility:	8.5 MI	Days in Database:	360 days
Average Daily Wind Speed:	4.52 MPH	Missing Days:	5 days
Average Sea Level Pressure:	30.01 IN		

(Weather data from the National Climatic Data Center - Global Surface Summary of Day)

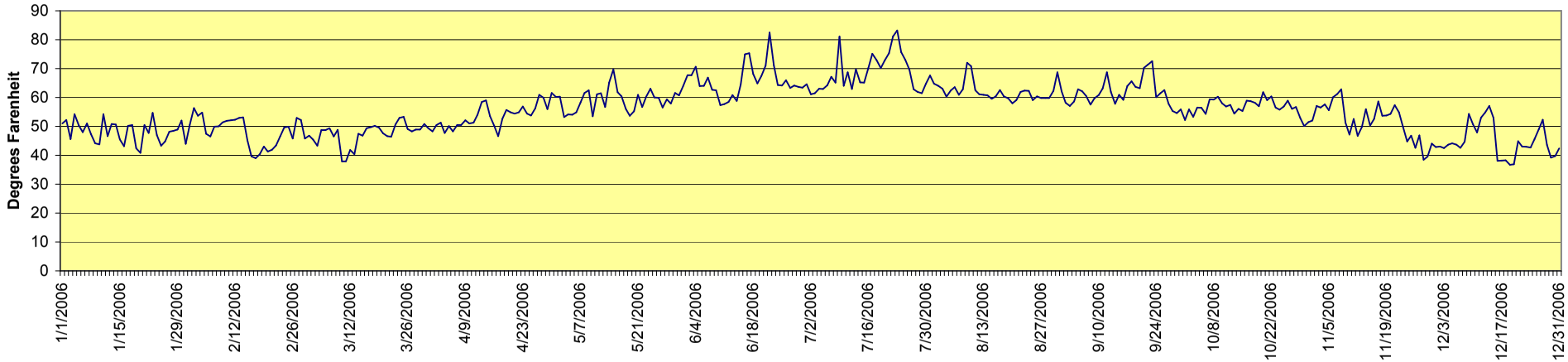
2006

Precipitation by Day

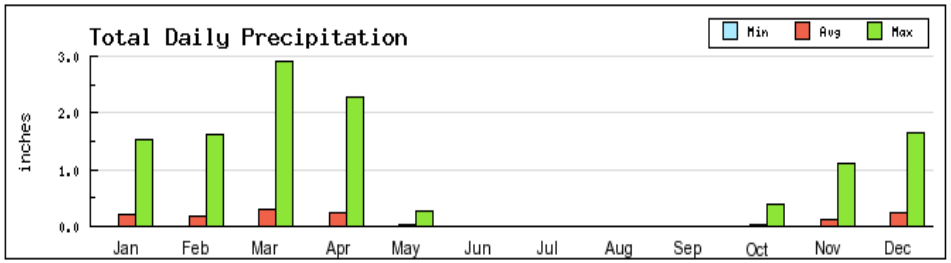


Santa Rosa Station (AWOS) Elevation 125 Ft.

Average Temperature by Day



Summary by Month



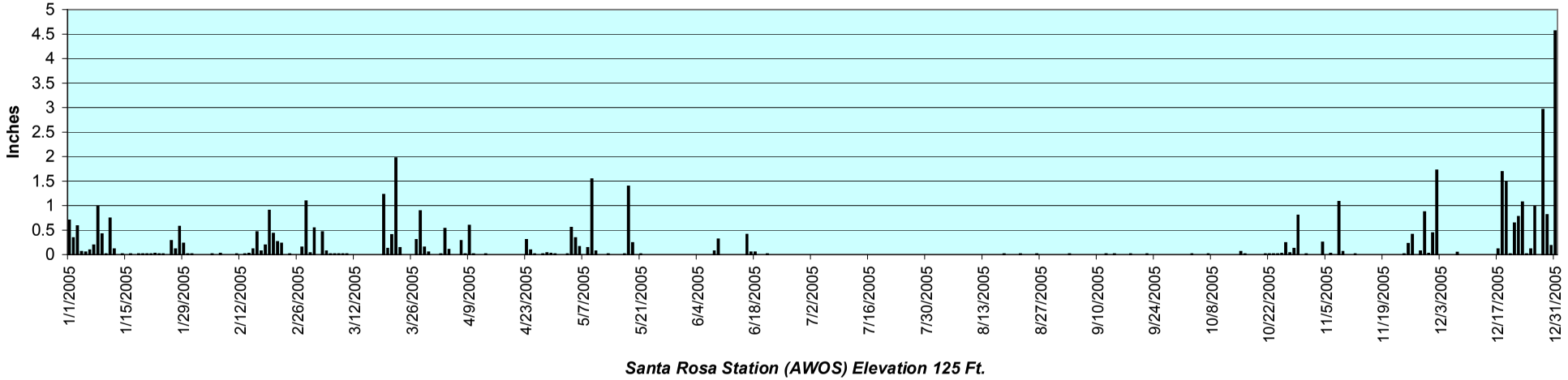
Annual Averages

Temperature		Search Summary	
Coldest Temperature:	24.1°F	Start Date:	Jan 1, 2006
Average Daily Temperature:	55.7°F	End Date:	Dec 31, 2006
Hottest Temperature:	108.0°F	Number of Years:	1
Conditions		Number of Days:	365 days
Average Daily Precipitation:	0.11 IN	Results Summary	
Average Visibility:	8.2 MI	Days in Database:	365 days
Average Daily Wind Speed:	4.17 MPH	Missing Days:	0 days
Average Sea Level Pressure:	29.99 IN		

(Weather data from the National Climatic Data Center - Global Surface Summary of Day)

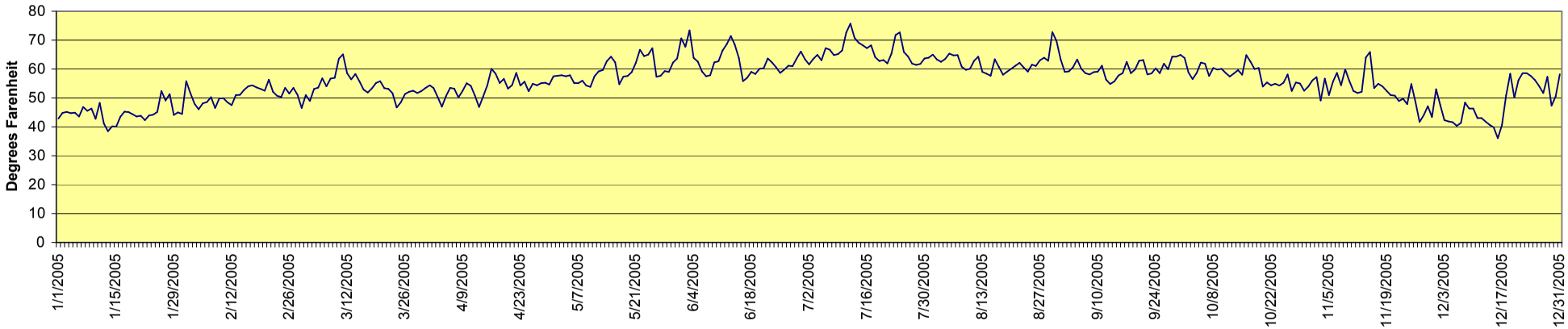
2005

Precipitation by Day

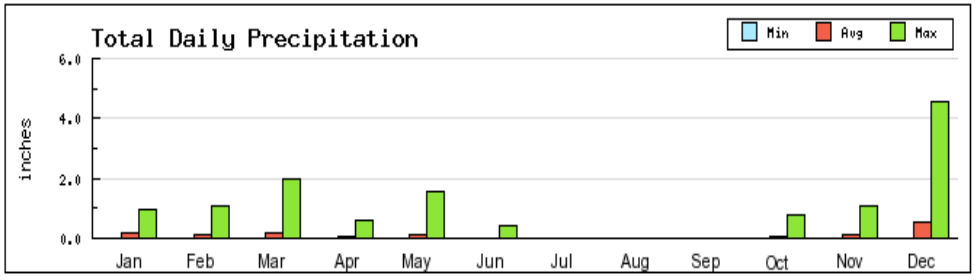


Santa Rosa Station (AWOS) Elevation 125 Ft.

Average Temperature by Day



Summary by Month



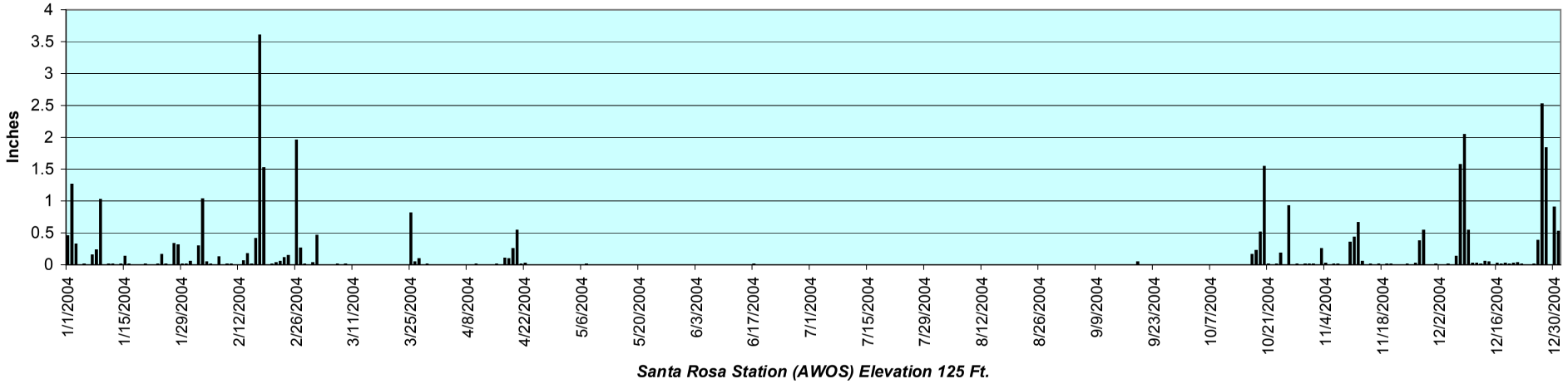
Annual Averages

Temperature		Search Summary	
Coldest Temperature:	26.1°F	Start Date:	Jan 1, 2005
Average Daily Temperature:	56.1°F	End Date:	Dec 31, 2005
Hottest Temperature:	100.9°F	Number of Years:	1
Conditions		Number of Days:	365 days
Average Daily Precipitation:	0.12 IN	Results Summary	
Average Visibility:	7.7 MI	Days in Database:	365 days
Average Daily Wind Speed:	4.76 MPH	Missing Days:	0 days
Average Sea Level Pressure:	29.97 IN		

(Weather data from the National Climatic Data Center - Global Surface Summary of Day)

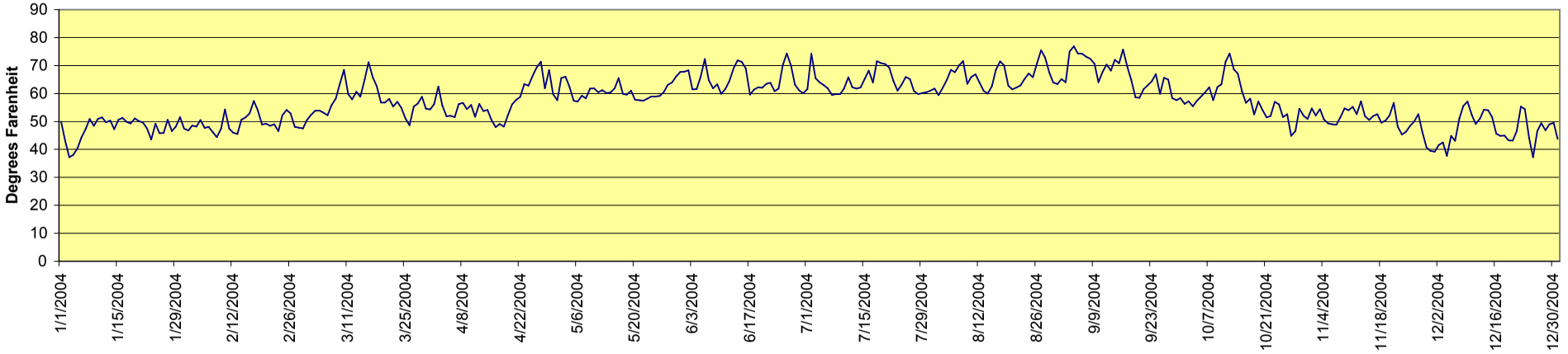
2004

Precipitation by Day

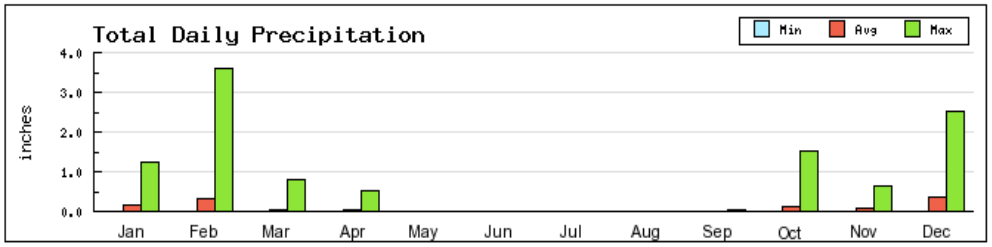


Santa Rosa Station (AWOS) Elevation 125 Ft.

Average Temperature by Day



Summary by Month



Annual Averages

Temperature		Search Summary	
Coldest Temperature:	26.1°F	Start Date:	Jan 1, 2004
Average Daily Temperature:	57.5°F	End Date:	Dec 31, 2004
Hottest Temperature:	100.0°F	Number of Years:	1
Conditions		Number of Days:	366 days
Average Daily Precipitation:	0.09 IN	Results Summary	
Average Visibility:	8.4 MI	Days in Database:	366 days
Average Daily Wind Speed:	4.96 MPH	Missing Days:	0 days
Average Sea Level Pressure:	29.98 IN		

(Weather data from the National Climatic Data Center - Global Surface Summary of Day)

Attachment H: NOSB Livestock Committee Recommendation for Rule Change

Pasture Requirements for the National Organic Program
Presented by the Livestock Committee to the NOSB

Adopted as a Board Draft for Posting
12 yes, 1 no, 1 abstain
November 17, 2005

Introduction:

On August 14, 2005, the USDA National Organic Program (NOP) returned two recommendations (Addenda B and C) for rule change adopted by the NOSB on March 2, 2005. In returning the documents, the NOP stated that the recommendations "lacked regulatory objectives." The Livestock Committee has revised the recommendations based on comments received and has expanded the "Background" section to clarify the Board's regulatory objectives.

In order to assure consumers that organic livestock products are produced to meet a consistent standard, the NOSB, as authorized by section 2110(d)(2) of the Organic Foods Production Act, recommends that 7 CFR Part 205 be amended.

The regulatory objectives of the Livestock Committee's revised recommendation are to establish pasture requirements that:

1. Are clear, consistent, and enforceable;
2. Apply to all regions of the country;
3. Are scale neutral;
4. Are attainable by organic livestock producers;
5. Protect soil and water quality and minimize soil erosion;
6. Promote the health and natural behavior of livestock; and
7. Meet consumer expectations.

1. **Background:**

The NOSB has made numerous recommendations to clarify pasture requirements for organic livestock operations. In June 2000, the NOSB recommended that, "the allowance for temporary confinement should be restricted to short-term events such as birthing of newborn or finish feeding for slaughter stock and should specifically exclude lactating dairy animals." (Preamble to Final Rule, page 80573)

In October 2001, the NOSB adopted a pasture recommendation that stated, in part:
"1. Ruminant livestock must have access to graze pasture during the months of the year when pasture can provide edible forage, and the grazed feed must provide a significant portion of the total feed requirements. The Farm Plan must include a timeline showing how the producer will work to maximize the pasture component of total feed used in the farm system.
3. The producer of bovine livestock may be allowed exemption to pasture during the following stages of production: a. Dairy stock under the age of 6 months; and b. Beef animals during final stage of finishing for no more than 120 days." (Addendum A.)

On March 2, 2005, the NOSB adopted two recommendations for rule change. The first recommendation (Addendum B) advised that the phrase "access to pasture for ruminants" at 205.239(a)(2) be changed to "ruminant animals grazing pasture during the growing season." The recommendation also contained exemptions from the pasture requirement during birthing, for dairy calves up to 6 months of age, and for finishing beef animals for no more than 120 days. The recommendation specifically prevented organic livestock operators from denying pasture to dairy cows during lactation.

The second recommendation adopted by the NOSB on March 2, 2005, (Addendum C) advised that the term “stage of production” in 205.239(a)(1) and (b)(2) be changed to “stage of life” to be consistent with the text used in 205.237(a)(2).

On August 16, 2005, the NOSB adopted a recommendation (Addendum D) for guidance clarifying the types of information to be included in a livestock operation’s Organic System Plan to assess compliance with pasture requirements; the limitations of “temporary confinement”; and tools to assess “appropriate pasture conditions.”

The NOSB has received thousands of comments in support of its draft recommendations. The preponderance of supportive comments have been submitted by dairy producers and consumers, stressing the environmental, animal health, and nutritional benefits derived from pastured ruminants.

Several comments have been received in opposition to NOSB draft recommendations. Those comments focused on the need for flexibility in pasture requirements in order to expand the number of acres in organic production.

The Livestock Committee has reviewed scientific studies concerning the health impacts of pasture vs confinement systems. The committee also reviewed studies on the nutritional qualities of products from pastured animals compared to products from confined animals.

The Livestock Committee reports the following:

1. Addendum E contains citations to scientific studies that document the benefits to animal health when ruminants are pastured. For example, pastured cows had lower somatic cell counts (SCC), fewer services per conception, and shorter calving intervals than confined cows. Udder diseases, including clinical mastitis, udder edema, and teat injuries were consistently less in herds managed on pasture compared with herds managed in confinement. In another study, researchers found fewer hoof disorders and eye disease in pastured vs. confinement herds.
2. Addendum E also cites studies showing benefits to food safety and milk quality from pastured animals. For example, pastured herds had lower bulk milk total bacteria counts than confinement herds.
3. Nutritional benefits of products from pasture-raised livestock are also cited in Addendum E. One study found that organic milk was 50% higher in Vitamin E, 75% higher in beta carotene and higher in omega 3 essential fatty acids than conventional milk. This study tied these qualities to organic cows having room to graze and a diet high in fresh grass and clover, and forage and less maize (corn). Intensively pastured cows produced milk with CLA concentrations that were about 3- to 4-fold greater than initial concentrations. Ribeye steaks from cattle finished on a combination of pasture and concentrate were higher in CLA content than steaks from cattle finished on conserved forages plus concentrates.
4. Addendum F cites research on the soil benefits from grazing dairy cows. As stated, grains used for livestock feed are all annuals and the soil must be tilled and planted each year, causing erosion from the tilled soil, carbon release from plowing, and the loss of organic matter. When pastured, the cows’ manure is deposited on the sod where it is incorporated immediately into the soil by the biological life of the soil. In confinement operations not only is the feed stored but also the manure must be stored, with the eventual loss of gasses such as ammonia and sulfur dioxide. In addition, pasture secures the soil with its root mass to protect it from erosion caused by wind and rain.

2. **Final Rule Citations Relevant to Pasture (*emphasis added*)**

205.2 Terms defined.

Pasture. Land used for livestock grazing that is managed to provide feed value and maintain or improve soil, water, and vegetative resources.

3. § 205.203 Soil fertility and crop nutrient management practice standard.

(a) The producer must select and implement tillage and cultivation practices that maintain or improve the physical, chemical, and biological condition of soil and ***minimize soil erosion***.

4. § 205.237 Livestock feed.

(a) The producer of an organic livestock operation must provide livestock with a total feed ration composed of agricultural products, ***including pasture and forage***, that are organically produced and, if applicable, organically handled: Except, That, nonsynthetic substances and synthetic substances allowed under § 205.603 may be used as feed additives and supplements.

205.238 Livestock health care practice standard.

(a) The producer must establish and maintain preventive livestock health care practices, including:

(3) Establishment of appropriate housing, ***pasture conditions***, and sanitation practices to minimize the occurrence and spread of diseases and parasites;

205.239 Livestock living conditions.

(a) The producer of an organic livestock operation must establish and maintain livestock living conditions which accommodate the health and ***natural behavior of animals***, including:

(2) ***Access to pasture for ruminants***:

(b) The producer of an organic livestock operation may provide ***temporary*** confinement for an animal because of:

(1) Inclement weather;

(2) The animal's stage of production;

(3) Conditions under which the health, safety, or well being of the animal could be jeopardized; or

(4) Risks to soil or water quality.

5. **Preamble to the Final rule – Citations Relevant to Pasture**

"The definition of "pasture" we included emphasizes that livestock producers must manage their land to provide nutritional benefit to grazing animals while maintaining or improving the soil, water, and vegetative resources of the operation. The producer must establish and maintain forage species appropriate for the nutritional requirements of the species using the pasture." Preamble page 80571

"A producer must provide livestock with a total feed ration composed of agricultural feed products, including pasture and forage that is organically produced." Preamble page 80572

"In the final rule, temporary confinement refers to the period during which livestock are denied access to the outdoors. The length of temporary confinement will vary according to the conditions on which it is based, such as the duration of inclement weather. The conditions for implementing temporary confinement for livestock do not minimize the producer's ability to restrain livestock in the performance of necessary production practices. For example, it is allowable for a producer to restrain livestock during the actual milking process or under similar circumstances, such as the administration of medication, when the safety and welfare of the livestock and producer are involved." Preamble page 80574

Recommendation:

The NOSB reaffirms its support for the positions taken by the Board in June 2000 and October 2001, as stated above, and the recommendations adopted by the Board on August 16 and March 2, 2005.

In revision, the NOSB recommends the following:

1. The NOSB recommends that §205.239(a)(2) be amended to read:

§205.239(a) The producer of an organic livestock operation must establish and maintain livestock living conditions which accommodate the health and natural behavior of animals, including:

(2) ~~Access to pasture for ruminants;~~ Ruminants shall graze pasture for at least 120 days per year, except during the following stages of life;

(i) birthing;
(ii) dairy animals up to 6 months of age; or
(iii) beef animals during a final finishing stage not to exceed 120 days.

2. The NOSB recommends that §205.239(a)(1) be amended to read:

§205.239(a) The producer of an organic livestock operation must establish and maintain livestock living conditions which accommodate the health and natural behavior of animals, including:

(1) Access to the outdoors, shade, shelter, exercise areas, fresh air, and direct sunlight suitable to the species, its stage of ~~production~~ life, the climate, and the environment;

3. The NOSB recommends that §205.239(b)(2) be amended to read:

§205.239(b) The producer of an organic livestock operation may provide temporary confinement for an animal because of:

(2) The animal's stage of ~~production~~ life;

4. The NOSB recommends that §205.237(b) be amended by adding a new section (7) to read:

(b) The producer of an organic operation must not:

(7) Prevent dairy animals from grazing pasture during lactation, except as allowed under §205.239(b).

Committee vote:

4 yes, 1 no, 1 absent

Addendum A: NOSB Recommendation – Adopted October 17, 2001
Pasture
Livestock Committee Recommendation
October 17, 2001

The NOSB Livestock committee puts forth the following proposed wording as a clarification for the present "access to pasture for ruminants" in the Final Rule. The following addresses what we see as the intent, the benefits, the recommended standard and the references in the NOP Final Rule related to the requirement of pasture for ruminants.

Intent:

The intent of requiring pasture for ruminants is to ensure an organic production system that provides a living condition that allows the animal to satisfy their natural behavior patterns, provides preventative health care benefits and answers the consumer expectation of humane animal care. The intent is to incorporate a pasture plan as a required part of the organic livestock system plan.

Pasture management fulfills an integral role in nutrition, health care and living condition requirements of organic ruminant production. Pasturing represents a complex task of applying the organic principles to an organic livestock operation. Pasture management in recent decades has evolved and like organic also requires a management plan for effective implementation.

Organic pasture management reflects a synthesis of crop and livestock production principles that works from the soil up to promote an interdependent community of plants and ruminants. Organically managed pasture should produce the quantity and quality of edible plants suitable to the species, stage of production, and number of animals. Pasture contributes to preventive health care management by enabling ruminants to develop and reproduce under conditions that reduce stress, strengthen immunity, and deter illness. Pasture affords ruminants the freedom of choice to satisfy natural behavior patterns. Pasture assures a relationship between the animal and land that satisfies both organic principles and international standards for organic livestock.

Benefits:

Pasture provides many benefits to the organic livestock farm. Significant benefits gained by pasturing ruminants are in the following areas:

Herd health -- Common benefits associated with pasture are improved feet and leg strength, less breeding problems, lower culling rates and enhanced immunity.

Environmental-Animals walking to pasture saves non-renewable energy, reduces equipment needs, spreads manure out naturally avoiding concentration of manure. Water pollution is a primary concern of organic consumers and concentrated manures from livestock production can be a major source of pollution to water sources.

Production-Pasturing can be as productive as dry lot production. While pasture may not produce record amounts of milk or the fastest growth rate for beef animals, net returns are favorable when all factors are measured.

Consumer expectation-The public comment from the two proposed rules shows a clear expectation that consumers have for pasture for ruminant livestock as part of humane livestock practices. There are food health and safety benefits from pasture produced livestock products that are important to the organic consumer.

NOSB LIVESTOCK COMMITTEE RECOMMENDED STANDARD

ACCESS TO PASTURE FOR RUMINANTS:

1. Ruminant livestock must have access to graze pasture during the months of the year when pasture can provide edible forage, and the grazed feed must provide a significant portion of the total feed requirements. The Farm Plan must include a timeline showing how the producer will work to maximize the pasture component of total feed used in the farm system.

2. The producer of ruminant livestock may be allowed temporary exemption to pasture because of:

a. Conditions under which the health, safety, or well-being of the animal could be jeopardized.

b. Inclement weather

c. Temporary conditions which pose a risk to soil and water quality.

3. The producer of bovine livestock may be allowed exemption to pasture during the following stages of production: [Note: recommendations for other ruminant livestock are being developed]

a. Dairy stock under the age of 6 months

b. Beef animals during final stage of finishing for no more than 120 days

Implementation issues:

Organic pasture management should respond to site-specific conditions by integrating cultural, biological, and mechanical processes that foster cycling of resources, promote ecological balance, and conserve biodiversity. Site-specific conditions in organic pasture management include the area of land available for grazing, the land's pasture carrying capacity, its suitability to accommodate the natural behavior of the herd, and its capacity to recycle the animals' waste. Organic ruminant producers must develop an organic system plan that correlates their intended practices with the site-specific conditions on their operation. Natural variation in climate, topography, precipitation, vegetation, and breed selection may mean organic system plans may vary widely. Nevertheless, because all organic pasture systems will be managed through the consistent application of the fundamental principles of cycling resources, promoting ecological balance, conserving biodiversity and promoting livestock's health and well being.

Organic ruminant producers must manage pasture by prioritizing the use of available resources to meet the nutritional, behavioral, and waste recycling requirements of the grazing herd. Land that normally produces stored feed may have to be converted to pasture to maximize pasture for the corresponding herd size. Producers may use allowed crop production practices such as seeding and the application of approved fertilizers and soil amendments to augment the productivity of their pasture. Conversely, producers may maintain no-input systems that provide ruminants with naturally occurring forage. The amount of producer activity is less important than the requirement that the practices that are implemented are consistent with the standards including conservation of the operation's natural resources. Organic ruminant producers will have to adapt the composition and size of their herd to the site-specific conditions of their operation.

FINAL RULE REFERENCES:

Pasture definition: Land used for livestock grazing that is managed to provide feed value and maintain or improve soil, water, and vegetative resources.

This definition leaves no question that the pasture is not an exercise lot due to the land management issues listed. Inherently this definition requires that adequate acres be supplied for the number of ruminants on the organic farm for the growing season. In order for pasture to maintain or improve soil, water, and vegetative resources it must be managed to avoid overgrazing. Pasture plants, whatever they are, can not be maintained or improved nor can they provide feed value unless the grazing system maximizes growth via the timing of the animals grazing.

Livestock health care practice:

205.238(a)-must maintain preventative livestock health care practices

Recent studies as well as practical experience by producers show significant benefits for livestock health in diverse areas including feet health, breeding, calving and improved immunity.

205.238(a)(3)-establishment of appropriate pasture conditions to minimize the occurrence and spread of diseases and parasites

The same practices that assure satisfying the definition of pasture also satisfy this requirement. Modern pasture management utilizes frequent rotation of pasture which can be timed to disrupt parasite and disease cycle.

Livestock living conditions

205.239(a)-must maintain livestock living conditions which accommodate the health and natural behavior of animals

Pasturing ruminants both satisfies this requirement and satisfies the consumer's perception of organic livestock living conditions.

205.239(a)(2)-access to pasture for ruminants

This standard combined with the definition and the above standards clearly support the requirement listed above.

Addendum B: NOSB Recommendation for Rule Change
Pasture Requirements for the National Organic Program
Adopted March 2, 2005

Introduction

The USDA National Organic Program (NOP) has requested NOSB provide guidance concerning the pasture requirements of the National Organic Program that the NOP can review and distribute to accredited certifying agents and post on the NOP website.

6.

The following recommendation is based on the NOSB's June 2000 and October 2001 pasture recommendations and the standards currently required under the NOP regulations, attached in addenda to this document. The NOP Final Rule defines "pasture" as "land used for livestock grazing that is managed to provide feed value and maintain or improve soil, water, and vegetative resources." 7 CFR 205.2. Pasturing is required under the Livestock Health Care Practice Standard (7 CFR 205.238) and under Livestock Living Conditions (7 CFR 239). The Final Rule provides that temporary confinement is allowed in certain circumstances. This recommendation will provide further guidance on the meaning of temporary confinement and stage of life.

As stated in the October 2001 NOSB recommendation, requiring pasture for ruminants ensures an organic production system which provides living conditions that allow animals to satisfy their natural behavior patterns, provides preventative health care benefits and answers the consumer expectation of humane animal care. Organic pasture management reflects a synthesis of crop and livestock production principles that works from the soil up to promote an interdependent community of plants and ruminants. Organically managed pasture should produce the quantity and quality of edible plants suitable to the species, stage of life, and number of animals. Pasture assures a relationship between the animal and land that satisfies both organic principles and international standards for organic livestock.

Recommendation

The NOSB recommends the following:

1. Rule Change for §205.239(a)(2)

The NOSB recommends that §205.239(a)(2) be amended to read:

§205.239(a)(2) ~~Access to pasture for ruminants~~ Ruminant animals grazing pasture during the growing season.

This includes all stages of life except:
a) birthing; b) dairy animals up to 6 months of age[5] and c) beef animals during the final finishing stage, not to exceed 120 days[6]. Note: Lactation of dairy animals is not a stage of life under which animals may be denied pasture for grazing.

Board vote:

13 – yes, 1 – no, 0 - abstain

Addendum C: Recommendation for a Rule Change Amending "Stage of Production" to read "Stage of Life" Adopted by the NOSB March 2, 2005

Background

Language within The National Organic Program Final Rule (7 CFR Part 205) creates a certain amount of ambiguity regarding the applicability of specific provisions of the regulation in the lifestage of livestock.

Sections 205.239(a)(1) and 205.239(b)(2) reference "stage of production" in regard to access to outdoors and temporary confinement. Section 205.237 (a)(2) utilizes the terminology "stage of life" to describe the allowance for specific levels of feed supplements or additives.

Development of enforceable standards for "stage of production" is problematic, particularly in regard to dairy animals. While "life" encompasses the total span of an animal's life, "production" refers only to that portion of life in which the animals is producing milk.

Recommendation

The NOSB recommends a rule change to make the language in §205.239(a)(1), §205.239(b)(2) consistent with the language in §205.237(a)(2). The language, therefore in §205.239(a)(1) would read "Access to outdoors, shade, shelter, exercise areas, fresh air, and direct sunlight suitable to the species its stage of ~~production~~ life, the climate, and the environment.

§205.239(b)(2) would be amended to read "animal's stage of ~~production~~ life."

Board Vote

13 – yes, 0 – no, 0 – abstain, 1 - absent

[5] The NOSB recommends 6 months for young animals to allow for weaning and prevention of parasites. (Footnote included as explanatory text – not to be included in rule change.)

[6] The NOSB recommends 120 days for the finishing of bovines based on comments received from beef producers who indicated that 120 days is the amount of time needed to achieve "choice" grades of beef. (Footnote included as explanatory text – not to be included in rule change.)

Addendum D: NOSB Livestock Committee Recommendation for Guidance on Pasture Requirements for the National Organic Program Adopted by the National Organic Standards Board August 16, 2005

Introduction

The USDA National Organic Program (NOP) has requested NOSB provide guidance concerning the pasture requirements of the National Organic Program that the NOP can review and distribute to accredited certifying agents and post on the NOP website. The NOSB reviewed the proposed guidance from the Livestock Committee at the March, 2005 meeting, and made several changes. The NOSB then requested additional public comments on the revised guidance.

The NOSB Livestock Committee received and reviewed comments on the revised guidance. The Livestock Committee has revised the guidance to include several of the comments, including clarification of the meaning of growing season, clarification of the role of the NRCS standards, and certain grammatical issues. A minority opinion on the Livestock Committee sought the inclusion of the word "approximate" in relation to the percentage of DMI to reflect the annualized aspect of the Organic System Plan, however this opinion was not adopted by the Committee. The Livestock Committee will present this guidance to the NOSB at the August meeting and request that the NOSB recommend this guidance to the NOP. The Livestock Committee believes that the guidance, combined with the rule changes recommended at the March 2005 meeting with regard to stage of life and lactation are sufficient, and no further rule changes are recommended at this time.

Guidance for interpretation of §205.239(a)(2)

A. Organic System Plan

Ruminant livestock should graze pasture during the months of the year when pasture can provide edible forage. The Organic System Plan should have the goal of providing a significant portion of the total feed requirements as grazed feed but not less than 30% dry matter intake on an average daily basis during the growing season but not less than 120 days per year. Growing season means the time of year of pasture growth from natural precipitation or irrigation. The Organic System Plan should include a timeline showing how the producer will satisfy the goal to optimize the pasture component of total feed used in the farm system. For livestock operations with ruminant animals, the operation's Organic System Plan should describe: 1) the amount of pasture provided per animal; 2) the average amount of time that animals are grazed on a daily basis; 3) the portion of the total feed requirement that will be provided from pasture; 4) circumstances under which animals will be temporarily confined; and 5) the records that are maintained to demonstrate compliance with pasture requirements.

B. Temporary Confinement

Temporary confinement means the period of time when a ruminant is denied pasture. The length of temporary confinement will vary according to the conditions on which it is based (such as the duration of inclement weather) and instances of temporary confinement should be the minimum time necessary. In no case should temporary confinement be allowed as a continuous production system. All instances of temporary confinement should be documented in the Organic System Plan and in records maintained by the operation.

Temporary confinement is allowed in the following situations:

1) During periods of inclement weather such as severe weather occurring over a period of a few days during the grazing season;
2) Conditions under which the health, safety, or well being of an individual animal could be jeopardized, including to restore the health of an individual animal or to prevent the spread of disease from an infected animal to other animals; or

3) To protect soil or water quality

C. Appropriate Pasture Conditions

As a tool for the farmer and the certifier, appropriate pasture conditions can be determined by referring to the regional Natural Resources Conservation Service Conservation Practice Standards for Prescribed Grazing (Code 528) for the number of animals in the Organic System Plan.

Approved by the Livestock Committee July 12, 2005
5 Yes
0 No
0 Abstain

Amended and adopted by NOSB August 16, 2005
13 Yes, 0 No, 1 Absent

Addendum E – Scientific Studies Comparing Pasture vs Confinement Systems

Benefits to Animal Health

1. **Bela, B., G. Nagy and I. Vinczeffy. 1995.** ***The influence of grazing on milk production and productive lifetime.*** **Debrecen Agricultural University, Dept. of Animal Breeding and Nutrition. Hungary. Poster presentation at 46th Annual Meeting of the European Association for Animal Production, Prague, Czech Republic.** Pastured cows had lower somatic cell counts (SCC), fewer services per conception and shorter calving intervals than confined cows.

2. **Bendixen, P.H., B. Vilson, I. Ekesbo, and D.B. Astrand. 1986.** ***Disease frequencies in dairy cattle in Sweden.*** **Prev Vet Med. 5: 263.** Confinement resulted in increased intramammary infections, udder edema, and stepped on teats.

3. **Berghaus, R.D., B.J. McCluskey, and R. J. Callan. 2005.** ***Risk factors associated with hemorraghic bowel syndrome in dairy cattle.*** **JAVMA. 226:1700-6.** Use of pasture as part of the lactating ration during the growing season was associated with decreased risk for hemorrhagic bowel syndrome.

4. **Cornell University 2004 Dairy Farm Business Summary. www.cce.cornell.edu** . Cull rates for conventional farms were 29% whereas for organic herds of similar size, it was 22%.

5. **Eberhart, R. J., R. A. Wilson, E. Oldham and T. Lintner. 1987.** ***Environmental effects on teat skin microflora.*** **Proceedings of the 26th Annual Mtg. Natl Mastitis Council, Orlando, FL.** Populations of environmental pathogens on teat ends were lower in pastured than confined herds.

6. **Goldberg, J.J., E.E. Wildman, J.W. Pankey, J.R. Kunkel, D.B. Howard, and B.M. Murphy. 1992.** ***The influence of intensively managed rotational grazing, traditional continuous grazing and confinement housing on bulk tank milk quality and udder health.*** **J Dairy Sci. 75:96-104.** Grazed herds had lower total bulk milk bacteria counts

(TBC) that confined herds did in the summer but there was no difference in the winter when all cows were confined. Trends towards fewer udder health problems in grazing herds were also observed.

7. **Pankey, J.W. 1989. *Improving milk quality and animal health by efficient pasture management.* NESARE final report. LNE89-017. http://www.sare.org/reporting/report_viewer.asp?pn=LNE89-017&ry=1989&rf=0 (last accessed 11/03/05).** Udder disease, including clinical mastitis, udder edema, and teat injuries were consistently less in herds managed on pasture compared with herds managed in confinement.

8. **Parker, W. J., L.D. Muller, S.L. Fales, and W.T. McSweeny. 1993. *A survey of dairy farms in Pennsylvania using minimal or intensive pasture grazing systems.* Prof. Anim. Sci. 9:159-165.** Authors found fewer hoof disorders and eye disease in herds that pastured vs. confinement.

9. **Regula G., J. Danuser, B. Spycher and B. Wechsler. 2004. *Health and welfare of dairy cows in different husbandry systems in Switzerland.* Prev Vet Med. 15:247-64.** Risks for lameness and teat injuries increased with increased confinement. Skin lesions on hocks and carpal joints were decreased in cattle allowed to go out at all times rather than cows that were allowed to go out only in good weather.

10. **Rodriguez-Lainz, A. P. Melendez-Retamal, D.W. Hird, D.H. Read and R.L. Walker. 1999. *Farm- and host-level risk factors for papillomatous digital dermatitis in Chilean dairy cattle.* Prev Vet Med. 42:87-97.** Loose housed cows had a higher risk of PDD, followed by cows in freestalls or in open corrals, compared to cows on pasture all year.

11. **Somers, J.G., K. Frankena, E.N. Noordhuizen-Stassen, and J.H. Metz. 2005. *Risk factors for digital dermatitis in dairy cows kept in cubicle houses in The Netherlands.* Prev Vet Med. 71:11-21.** Factors increasing risk of digital dermatitis were: restricted grazing time, high concentrate feeding after calving, feeding by-products, infrequent hoof trimming, and housing dry cows with lactating cows before calving.

12. **Somers, J.G., Frankena, K., E. N. Noordhuizen-Stassen and J.H. Metz. 2003. *Prevalence of claw disorders in Dutch dairy cows exposed to several floor systems.* J Dairy Sci 86:2082-93.** Cows that were not grazed were at high risk for most claw disorders when compared to cows with pasture access. All herds on concrete flooring were affected by digital dermatitis.

13. **Singh S.S., W.R. Ward, K. Lautenbach, J.W. Hughes, and R.D Murray. 1993. *Behaviour of first lactation and adult dairy cows while housed and at pasture and its relationship with sole lesions.* Vet Rec 133:469-74.** Compared lying time and frequency of lying and sole disorders in pastured herd vs. housed. Pastured cows spent more time lying (which translates into more rumination time) and got up and down less frequently than housed cows. No difference in sole disorders.

14. **Waage, S., S. Sviland, and S. A. Odegaard. 1998.** ***Identification of risk factors for clinical mastitis in dairy heifers.*** **J. Dairy Sci. 81:1275-84.** Heifers kept on pasture in the summer were at a decreased risk for clinical mastitis.

15. **Washburn, S.P., S.L. White, J.T. Green, Jr. and G.A. Benson. 2002.** ***Reproduction, mastitis and body condition of seasonally calved Holstein and Jersey cows in confinement or pasture systems.*** **J Dairy Sci. 85:105-111.** There was no difference in reproductive performance between pasture and confinement herds. Pastured herds had lower body condition scores than confinement. However, confinement herds had 1.8 times more clinical mastitis than pastured and eight times the rate of culling for mastitis.

16. **White, S.L., G.A. Benson, S.P. Washburn, J.T. Green Jr. 2002.** ***Milk production and economic measures in confinement of pasture systems using seasonally calved Holstein and Jersey*** **cows. J Dairy Sci. 85:95-104** Compared confinement cows on TMR vs pasture based cows. Lower milk production on pasture but decreased feed and labor costs. Also decreased culling for pasture based herds.

17. **New York Intensive Grazing Farms (Cornell Dairy Farm Business Summary).** Eight year average (1996-2003) for veterinary and treatment costs per cow were $77 for non-graziers vs. $61 for graziers.

Benefits to Food Safety and Milk Quality

7. **Bailey, G.D., B.A. Vanselow, M.A. Hornitzky, S.I. Hum, G.J. Eamens, P.A. Gill, K.H. Walker and J.P. Cronin. 2003.** ***A study of the foodborne pathogens: Campylobacter, Listeria and Yersinia in faeces from slaughter age cattle and sheep in Australia.*** **Comm Dis Intell. 27:249-57.** Prevalence of *Campylobacter* shedding among different management groups was: dairy cattle (6%), feedlot cattle (58%), pastured beef cattle (2%), mutton sheep (0%), prime lambs (8%). All dairy cattle were on pasture.

8. **Fossler, C.P., S.J. Wells, J.B. Kaneene, P. L. Ruegg, L.D. Warnick, L.E. Eberly, S.M. Godden, L.W. Halbert, A.M. Campbell, C.A. Bolin, and A.M. Zwald. 2002.** ***Cattle and environmental sample-level factors associated with the presence of Salmonella in a multi-state study of conventional and organic dairy farms.*** **J Dairy Sci. 85:105-111.** Farms with at least 100 cows were more likely to *Salmonella*-positive cattle compared with smaller farms.

9. **Huston C.L., T.E. Wittum, B.C. Love, and J.E. Keen. 2002.** ***Prevalence of fecal shedding of Salmonella spp. in dairy herds*** **JAVMA 220:645-9.** Large herd size, intensive management, use of freestalls, and use of straw bedding were associated with *Salmonella* shedding and chronic dairy herd infection.

10. **Husu, J.R. 1990.** ***Epidemiological studies on the occurrence of Listeria monocytogenes in the feces of dairy cattle.*** **Zentralb Veterinar B. 37:276-82.** Seasonal variation in shedding of *Listeria* spp. in dairy cattle was examined by collecting 3,878 fecal samples

over two years. Prevalence of *Listeria* spp. and *Listeria monocytogenes* was higher during the indoor season than in samples collected from animal on pasture.

11. **Josson, M.E., A. Aspan, E. Eriksson, and I. Vagsholm. 2001.** ***Persistence of verocytotoxin-producing Escherichia coli O157:H7 in calves kept on pasture and in calves kept indoors during the summer months in a Swedish dairy herd.*** Fecal samples from calves kept on pasture (n=6) and calves housed indoors (n=6) were cultured monthly for five months. Fecals from calves on pasture were negative for this pathogenic *E. coli* were negative on all sampling occasions. For the indoor housed group, there were between one and six positive individuals at each sampling.

12. **McKinnon, C. H., G.H. J. Rowlands, and A. J. Bramley. 1990. The effect of udder preparation before milking and contamination from the milking plant on bacterial numbers in bulk milk of eight dairy herds. J. Dairy Res. 57:307.** Pastured herds had lower bulk milk total bacteria counts than confinement herds

Nutritional benefits of products from pasture-raised livestock

1. **Ädnøy, T., A. Haug, O. Sørheim, M.S. Thomassen, Z. Varzegi, and L.O. Eik. 2005.** ***Grazing on mountain pastures—does it affect meat quality in lambs?*** **Livestock Prod Sci. 94:25-31.** Meat from lambs raised in extensive systems on mountain range has certain qualities that may be used in promotion of local and regional products.

2. **Aurousseau, B., D. Bauchart, E. Calichon, D. Micol, and A Priolo. 2004.** ***Effect of grass or concentrate feeding systems and rate of growth on triglyceride and phospholipids and their fatty acids in the M. longissimus thoracic of lambs.*** **Meat Sci. 66:531-541.** Muscle lipids characteristic of grass fed lambs fulfilled the recommended features of human food consumption much better than that of stall fed lambs, namely CLA and C18:3n-3.

3. **Dannenberger, D., K. Nuernberg, G. Nuernberg, N. Scollan, H. Steinhart, and K. Ender. 2005.** ***Effect of pasture vs. concentrate diet on CLA isomer distribution in different tissues lipids of beef cattle.*** **Lipids. 40:589-98.** Pasture feeding resulted in significantly increased concentrations of the sum of CLA isomers in Holstein and Simmental muscle tissue.

4. **Elgersma, A., G. Ellen, H. van der Horst, H. Boer, P.R. Dekker, and S. Tammings. 2004.** ***Quick changes in milk fat composition from cows after transition from fresh grass to a silage diet.*** **Anim Feed Sci Tech. 117:13-27.** Average CLA content of milk decreased markedly within two days of switch cows from pasture ration to silage. The milk fatty acid profile of grazing cows was more favourable from a consumer health standpoint than that of silage-fed cows.

5. **Institute of Grassland and Environmental Research. 2004.** Found that organic milk has higher levels of Omega essential acids than the conventional type. Tests carried out

on samples at the research centre indicated that organic milk contains two-thirds more omega 3 essential fatty acids than conventional milk.

6. **Kay, J.K., J.R. Roche, E.S. Kolver, N.A. Thomson, and L.H. Baumgard. 2005.** ***A comparison between feeding systems (pasture and TMR) and the effect of vitamin E supplementation on plasma and milk fatty acid profiles in dairy cows.*** **J Dairy Res. 72:322-32.** Milk from cows on pasture or cows feed a TMR supplemented with Vitamin E were compared. Milk from cows grazing pasture had higher CLA, vaccenic acid, and lower trans-10 fatty acids than cows on TMR with supplemental vitamin E. Unknown pasture constituents are likely responsible for the difference.

7. **Nielsen, J., T. Lund-Nielsen, and L. Skibstead. 2004. Danish Research Center for Organic Farming.** Found that organic milk was 50% higher in Vitamin E, 75% higher in beta carotene and higher in omega 3 essential fatty acids than conventional milk. This study tied these qualities to organic cows having room to graze and a diet high in fresh grass and clover, and forage and less maize.

8. **Sonon Jr, R. D. Beitz and A. Trenkle. 2004.** ***Improving Health Benefits of Beef & Milk: A Field Study*****. A. S. Leaflet R1864, Iowa State University.** Intensively pastured cows produced milk with CLA concentrations that were about 3- to 4-fold greater than initial concentrations. Ribeye steaks from cattle finished on a combination of pasture and concentrate were higher in CLA content than steaks from cattle finished on conserved forages plus concentrates

9. **Ward, A. T., K.M. Wittenberg, H.M. Froebe, R. Przybylski, and L. Malcolmson. 2003.** ***Fresh forage and solin supplementation on conjugated linoleic acid levels in plasma and milk.*** **J Dairy Sci. 86:1742-50**. Fresh forage, compared to conserved hay, increase milk fat vaccenic acid and CLA proportions by 15 and 22% respectively. Addition of solin seed increased these levels further to 41 and 25%.

Addendum F - Soil Benefits From Grazing Dairy Cows

The use of pasture for feeding dairy cows vs. the use of stored feeds:
By: A. Fay Benson, Grazing Educator with the Cornell University Cooperative Extension

The benefits of allowing the dairy cow to harvest her own forage through the use of “Rotational Grazing” vs. feeding the cow stored feeds is the result of a number of basic differences in how the feedstuffs are grown. In rotational grazing the forage consumed by the cow is at its peak nutrient density, this grazing stage occurs when the plant is too small physically to be harvested by agricultural machines. Stored forage is allowed to grow to the stage where it is efficient to be harvested by machine. This results in the stored feed not being as nutrient dense and in order to balance the nutrient needs of the cow more grains must be fed. It is from this basic difference that the following benefits of grazing to the environment derive from:

- Grains are all annuals and the soil must be tilled and planted each year, causing erosion from the tilled soil, carbon release from plowing and the resulted Organic Matter loss.
- The cows’ manure is deposited on the sod where it is incorporated immediately into the soil by the biological life of the soil. In confinement operations not only is the feed stored but also the manure must be stored, with the eventual loss of gasses such as ammonia and sulfite (Greenhouse gasses).

- The pasture stand secures the soil with its root mass to protect it from erosion caused by wind and rain.

These benefits to the environment are recognized by USDA's Natural Resource Conservation Service (NRCS). Some of the programs that they have developed to encourage the use of pasture are:

- The **Grazing Lands Conservation Initiative** mission is to provide high quality technical assistance on privately owned grazing lands on a voluntary basis and to increase the awareness of the importance of grazing land resources.
- The **Conservation Partnership Initiative** is a voluntary program established to foster conservation partnerships that focus technical and financial resources on conservation priorities in watersheds and airsheds of special significance.
- The **Grassland Reserve Program** is a voluntary program offering landowners the opportunity to protect, restore, and enhance grasslands on their property.
- The **Environmental Quality Incentives Program** was reauthorized in the Farm Security and Rural Investment Act of 2002 (Farm Bill) to provide a voluntary conservation program for farmers and ranchers that promotes agricultural production and environmental quality as compatible national goals
- The **Conservation Reserve Program** provides technical and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner.

The information below was taken from a paper published by the Illinois NRCS:

Impact. When falling raindrops strike bare soil, the impact causes both splash erosion and soil compaction, resulting in faster runoff and increased erosion. Good plant cover breaks the force of the raindrops, and allows the water to seep into the soil. The soil can act as a large reservoir, holding moisture, reducing flooding and enhancing water quality. Water stored in the soil promotes a greater and more consistent supply of forage.

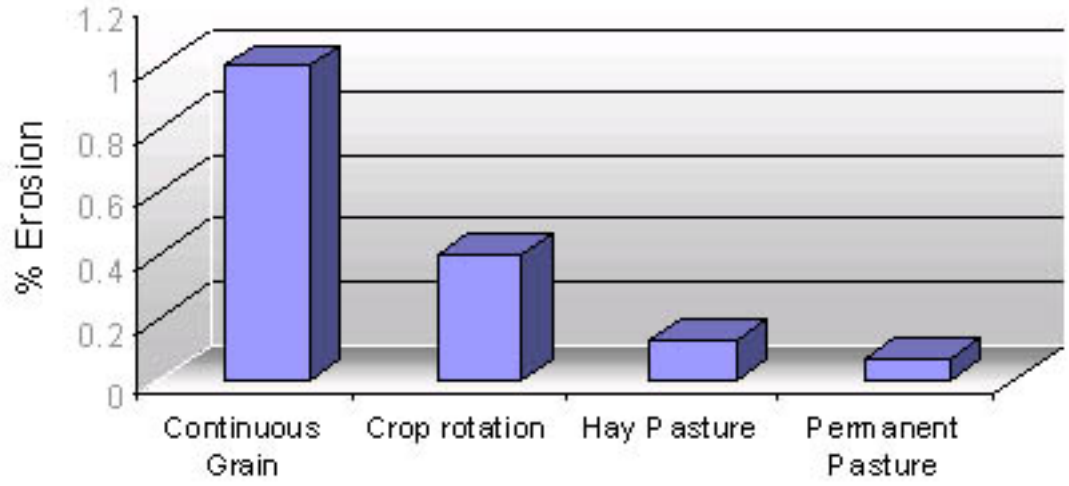
Soil. Coarse soil takes in water faster than fine soil, but stores less within the root zone of most plants. Water that moves below the root zone of plants recharges groundwater supplies, and sometimes reappears down slope as a spring or creek. Because the movement through the soil is slow, the water supply downstream is cleaner, and streams flow longer than where moisture runs off over the soil surface. Where the surface is bare, less moisture enters the soil and surfaces are hotter causing much of the stored water to evaporate during hot, windy days instead of being used for plant growth.

Plants. A healthier, more productive grassland water cycle can be achieved by proper grazing. Plants and the litter they produce affect the water cycle in several ways. Plants break the impact of raindrops on the soil surface, and serve as small windbreaks to hold snow. Plants shade the soil's surface causing the soil surface to be cooler, which creates a better environment for plant growth. Litter acts as a sponge, and slows runoff, giving moisture more time to move into the soil. Plant roots increase soil porosity so water moves more readily into and through the soil. Roots also hold soil particles in place, reducing erosion. Vigorous plant cover is an important part of influencing the grassland water cycle, and making effective use of precipitation.

Research supporting grazing over confinement housing:

Managed grazing is best way to reduce soil erosion on our productive land.
Recent **research from Wisconsin's Discovery Farms** has demonstrated that on gently sloping land, land in corn and soy production had up to six times the amount of soil erosion as managed pasture. The rate of soil erosion on the cropped land is not considered sustainable.

Ontario Ministry of Agriculture and Food, Robert P. Stone and Neil Moore Currently, the United States is losing three billion tons of nutrient-rich topsoil each year. Growing corn and soy for animal feed using conventional methods causes a significant amount of this soil loss. Compared with row crops, pasture reduces soil loss by as much as 93 percent.



Jackson, R. B., J. L. Banner, E. G. Jobbagy, W. T. Pockman, and D. H. Wall. "Ecosystem Carbon Loss with Woody Plant

It's a well known fact that trees draw carbon dioxide from the air and store it as carbon, thereby slowing the rate of global warming. But a new study from Duke University reveals that restoring native grasslands might be a better solution than planting trees in wetter areas of the country. "Grasses are deceptively productive," says lead investigator Robert Jackson. "You don't see where all the carbon goes, so there is a misconception that woody species [such as trees and shrubs] store more carbon. That's just not the case." Grasses store vast amounts of carbon in their underground root mass.

Raising cattle on grass is one way to make it financially feasible to expand our native grasslands. Although cows generate their own greenhouse gasses, the net effect of raising ruminants on pasture is to slow global warming.

Studemann, J., Fransleubbers, A., Seman, D., 2002, The Role of Animal and Pasture Management in Carbon Sequestration , USDA Agricultural Research Service, Southern Association Of Agricultural Scientists Proceedings; Carbon stored in soil during the first five years of bermudagrass management was two to three times greater when the grass was grazed than when it was harvested for hay or left unharvested.

Appendix:
Economic comparisons between grazing and non-grazing

1. Butler, L.J. and Gerry Cohn. 1993. "The Economics of New Technologies in Dairying: BGH vs. Rotational Grazing," in William C. Liebhardt (ed.), ***The Dairy Debate: Consequences of Bovine Growth Hormone and Rotational Grazing Technologies*** **(pp. 189-246). Davis, CA: University of California Sustainable Agriculture Research and Education Program.**

The authors compare the hypothetical profitability of two dairy technologies, BGH and MIRG. The main point is that in the former, gross revenues rise as do costs, while in the latter milk production falls but so do costs. On a per-cow basis, net revenue is shown to be the same, but on a per-cwt. basis MIRG has a $0.44 advantage. They also explore the effects of changes in milk prices, milk production, interest rates, feed costs, and government policies on the profitability of the two systems.

2. Carr, S.B., et al. 1994. "Results of Intensive, Rotational Grazing on a Virginia Dairy Farm." ***Journal of Dairy Science*** **77(11):3478.**

This is an abstract from an ADSA meeting. A dairy farm converted to MIRG. Daily milk production and milk fat content both fell. Herd health increased. Cost of purchased feeds fell by more than half. Net cash income increased by 43%. Even more impressively, net income minus depreciation increased by 70%, and net income adjusted for inventory changes increased by 227%.

3. Conneman, George, et al. 1997. "Dairy Farms Business Summary: Intensive Grazing Farms New York 1996." Cornell University. Ithaca, NY.

A basic comparison of the profitability and the factors that seem to affect it for 30 grazing farms in NY. Factors investigated include percentage of forage coming from pasture, grain fed to cows, and frequency of rotations. Operating cost per cwt. was slightly lower on grazing farms than non-grazing ($11.29 vs. $11.84). Net farm income was much higher on grazing farms ($31,876 vs. $24,607). Report contains extensive data tables.

4. Conneman, George, et al. 1998. "Dairy Farms Business Summary: Intensive Grazing Farms New York 1997." Cornell University. Ithaca, NY.

Identical in form to study #18, but updated for 1998. Economic analysis is carried out on 35 grazing farms in NY. Operating cost per cwt. was slightly lower on grazing farms than non-grazing ($11.08 vs. $11.90). Net farm income was much higher on grazing farms ($19,705 vs. $9,502). Report contains extensive data tables.

5. Conneman, George, et al. 1999. "Dairy Farms Business Summary: Intensive Grazing Farms New York 1998." Cornell University. Ithaca, NY.

A continuation of reports #18 & 19, now updated for 1999. Economic analysis is carried out on 31 grazing farms in NY. Operating cost per cwt. was slightly lower on grazing farms than non-grazing ($10.53 vs. $11.26). Net farm income was much higher on grazing farms ($58,373 vs. $45,390). Report contains extensive data tables.

6. Conneman, George, et al. 2000. "Dairy Farms Business Summary: Intensive Grazing Farms New York 1999." Cornell University. Ithaca, NY.
A continuation of reports #18, 19, & 20, now updated for 2000. Operating cost per cwt. was slightly lower on grazing farms than non-grazing ($10.53 vs. $10.73). Net farm income was lower on grazing farms for the first time in four years ($42,858 vs. $43,135). Report contains extensive data tables.

7. Hoard's Dairyman. 2003. "Save Money by Grazing Your Heifers." ***Hoard's Dairyman*** **148(3):96.**
144 dairy heifers were split into two grazing groups and two feedlot groups. Grazing heifers gained slightly more weight. More significantly, total costs for grazing heifers was $0.95 per cow per day, versus $1.49 for feedlot heifers - an advantage of $0.54 per head per day.

8. Dartt, Barbara and James Lloyd. 1998. ***A Comparison of Management-Intensive Grazing and Conventionally Managed Michigan Dairies: Profitability, Economic Efficiencies, Quality of Life, and Management Priorities.*** **Unpublished thesis. Department of Agricultural Economics, Michigan State University. East Lansing, MI.**
This study compared 18 conventional dairies to 35 MIRG farms through surveys. Though asset levels were similar, grazing farms were 7% more profitable and 11% more capital efficient. Furthermore, grazing farms were 26% more "operating efficient" and 32% more "labor efficient." Both groups indicated a similar satisfaction with quality of life, though it was found that spouses from grazing farms took a more active role in the farm.

9. Dartt, B.A., et al. 1999. "A comparison of profitability and economic efficiencies between management-intensive grazing and conventionally managed dairies in Michigan." ***Journal of Dairy Science*** **82:2412-2420.**
A comparison of 35 grazing and 18 conventional dairies in MI. Grazing dairies proved to be more profitable than conventional dairies, exhibiting superior asset use, operational practices, and labor efficiencies. However, the confined geographic region of this study makes extrapolation to other regions very tenuous.

10. Emmick, Darrell L. and Letitia F. Toomer. 1991. "The Economic Impact of Intensive Grazing Management on Fifteen Dairy Farms in New York State." ***Forage and Grassland Conference.*** **American Forage and Grassland Council.**
Based on a study initiated by the Soil Conservation Service in 1989 of fifteen dairy farms in New York, the authors conclude that a more intensive use of pasture on many New York dairy farms could reduce input costs and enhance overall profitability, with the exception of large dairy operations or farms where there is an insufficient amount of pasture. On average, farms in the study which had switched to grazing saved $153 per cow per year compared to their operations prior to conversion.

11. Ford, Steve. 1996. "Grazing Looks Better as Dairy Profits Tighten." ***Farm Economics.*** **Cooperative Extension, Pennsylvania State University College of Agricultural Sciences. University Park, PA.**
Writing at a time of depressed prices for dairy farmers, the author argues that as feed costs increase and milk prices decline, grazing is a more and more attractive option. He cites several

bits of data to illustrate grazing's advantage, including 1) daily ration costs of confinement vs. grazing as grain prices rise and 2) breakeven yields for alfalfa and corn relative to grass pasture.

12. Gloy, B.A., L.W. Tauer and W. Knoblauch. 2002. "Profitability of Grazing Versus Mechanical Forage Harvesting on New York Dairy Farms." ***Journal of Dairy Science*** **85:2215-2222.**
Financial data from 237 nongrazing and 57 grazing farms in NY were compared using a regression analysis. Profitability between and among the two systems ranged widely and overlapped, though in general grazing systems were shown to be at least as profitable as nongrazing systems. Three factors have the strongest impact on profitability for graziers: herd size, milk production per cow, and milk prices.

13. Hanson, Gregory D. 1995. "Adoption of Intensive Grazing Systems." ***Journal of Extension*** **33(4).**
Production and financial data were obtained from a random stratified sample of 50 grazing farmers in PA. One interesting finding was that these farms were actually practicing moderate intensive grazing, not fully intensive grazing. Because of reduced costs, net returns to grazing were more than double those to a corn silage system and more than six times those to a hay operation. The article concludes by discussing the challenges facing Extension agents in disseminating grazing information to farmers.

14. Hanson, Gregory D., et al. 1998. "Profitability of Moderate Intensive Grazing of Dairy Cows in the Northeast." ***Journal of Dairy Science*** **81:821-829.**
Grazing dairies were compared to non- or partially-grazing dairies through USDA survey data. Though non-grazing dairies showed much higher gross farm incomes, grazing dairies showed higher returns per cow and net farm income, using fewer cows. Results of a survey of 50 PA graziers are also discussed.

15. Kliebenstein, James B., Carrol L. Kirtley and Lloyd A. Selby. 1983. "A Survey of Swine Production Health Problems a. Kliebenstein, James B., Carrol L. Kirtley and Lloyd A. Selby. 1983. "A Survey of Swine Production Health Problems nd Health Maintenance Expenditures." ***Preventive Veterinary Medicine*** **1(4):357-369.**
170 pork producers in MO reported disease and death information in a 1978-79 survey. Looking at expenditures for veterinary services, the pasture producers had the lowest overall costs. The average veterinary cost per animals for pastured pigs was less than half the average cost for confined pigs.

16. Kole, Glenn, et al. 1992. "Utilizing Controlled Grazing on Dairy Farms in Northern Michigan." ***Forage and Grassland Conference.*** **American Forage and Grassland Council.**
The authors report on the reduction in production costs of four farms in Northern Michigan that converted from conventional methods to controlled grazing. The range of savings on the four farms was $8200-15,000 in real dollars. Average savings across all four farms was $2/cwt. The text also mentions briefly the social and emotional benefits of controlled grazing for the farm family.

17. Kriegl, Thomas. 2000. "Wisconsin Grazing Dairy Profitability Analysis: Preliminary Fourth Year Summary." University of Wisconsin Center for Dairy Profitability. Madison, WI.
45 graziers in WI provided financial data, and comparisons are made between graziers and confinement operations. It is found that MIRG is an economically competitive system, that it is more economically flexible than a confinement system, and that it is not necessarily a reduced management system, but rather a different management system.

18. Kriegl, Thomas. 2001. "Wisconsin Grazing Dairy Profitability Analysis: Preliminary Fifth Year Summary." University of Wisconsin Center for Dairy Profitability. Madison, WI.
This report is a continuation of a longitudinal study (see #33), with a fifth year of data added. Again 45 grazing farms provided financial data. The conclusions drawn the year before are merely strengthened here: MIRG is an economically competitive and flexible system. It is also found that, on the whole, graziers have higher net income per cow and lower debt per cow than confinement farms.

19. Kriegl, Thomas. 2002. "Fact Sheet #5: Grazing vs. Confinement Farms." Regional Multi-State Interpretation of Small Farm Financial Data from the First Year Report on 2000 Great Lakes Grazing Network Grazing Dairy Data. University of Wisconsin Center for Dairy Profitability. Madision, WI.
This is a factsheet based on a larger report (study #3) that specifically points out the comparisons between graziers and confinement dairies in WI and NY. Net incomes per cow for grazier vs. confinement are $617 vs. $296 in WI and $315 vs. $181 in NY. Net incomes per cwt. are: $3.44 vs. $1.20 in WI and $1.38 vs. $0.65 in NY.

20. Kriegl, Thomas. 2004. "Fact Sheet #5: Grazing vs. Confinement Farms - Year 3." Regional Multi-State Interpretation of Small Farm Financial Data from the Third Year Report on 2002 Great Lakes Grazing Network Grazing Dairy Data. University of Wisconsin Center for Dairy Profitability. Madision, WI.
This is a factsheet based on a larger report (study #4) that specifically points out the comparisons between graziers and confinement dairies in WI and NY. Net incomes per cow for grazier vs. confinement are $651 vs. $641 in WI and $786 vs. $672 in NY. Net incomes per cwt. are $3.14 vs. $2.36 in WI and $2.86 vs. $2.34 in NY.

21. Kriegl, Thomas and Gary Frank. 2004. "An Eight Year Economic Look at Wisconsin Dairy Systems." University of Wisconsin Center for Dairy Profitability. Madison, WI.
Based on eight years of data, this is a comparison of net income per cwt. for three kinds of WI dairy farms: grazing, traditional confinement (50-75 cows), and large modern confinement (>250 cows). Under three different cost scenarios, MIRG farms consistently show the highest net incomes. When all operating costs are taken into account, grazing returned an average of $3.96/cwt. over 8 years; traditional confinement $2.39/cwt.; and large modern confinement $1.50/cwt.

22. Liebhardt, William C. 1993. "Farmer Experience with Rotational Grazing: A Case Study Approach," in William C. Liebhardt (ed.), *The Dairy Debate: Consequences of*

Bovine Growth Hormone and Rotational Grazing Technologies **(pp. 131-188). Davis, CA: University of California Sustainable Agriculture Research and Education Program.**
The author presents in exhaustive detail the results of 12 case studies of dairy farms from 5 different states, plus the results of several other academic studies. Time after time, with tables of data to illustrate, the same theme is presented: feed costs are lower, labor demands are lower, milk production is sometimes lower, and profit is higher on grazing dairies than on confinement dairies.

23. Moore, K. C. and J. R. Gerrish. 1995. "Economics of Grazing Systems Versus Row Crop Enterprises." ***Forage and Grassland Conference.*** **American Forage and Grassland Council.**
The authors state that research in Missouri and Iowa has shown that net returns can be substantially improved under rotational grazing, and income will more than cover the costs of developing the necessary infrastructure, especially on erosive marginal land with poor crop yields. Using enterprise budgets, they compare the economics of beef production across a 3-year average for 3 intensities of grazing: 3-, 12-, and 24-paddock systems. Returns above cost per acre are $77, $104, and $109, respectively.

24. Mowrey, Coleen M., Carl E. Polan and Gordon E. Groover. 2000. "Can Grazing be Profitable?" ***Hoard's Dairyman*** **145(16):627.**
The authors relate the results of five different studies in NY, PA, WI, and VA, each of which illustrates the same general phenomenon: despite lowered milk yields and lower gross incomes, grazing farms consistently bring higher profits per cow or higher returns to labor due to reduced input and labor costs. Even when grazing farms brought lower net incomes, they still brought greater returns to labor due to smaller assets.

25. **Murphy, William M. and John R. Kunkel. 1993. "Sustainable Agriculture: Controlled Grazing vs. Confinement Feeding of Dairy Cows," in William C. Liebhardt (ed.),** ***The Dairy Debate: Consequences of Bovine Growth Hormone and Rotational Grazing Technologies*** **(pp. 113-130). Davis, CA: University of California Sustainable Agriculture Research and Education Program.**
This chapter lays out three main criteria for "sustainable agriculture" -- profitability, quality of life, and positive rural landscape -- and then argues that MIRG satisfies the criteria better than confinement dairying. Topics are illustrated with case studies, and include: increased profitability, lowered costs and labor requirements, better herd health, higher quality of life for the farmer, reduced erosion on farmland, and more farmers farming.

26. **Murphy, William M., John R. Rice and David T. Dugdale. 1986. "Dairy farm feeding and income effects of using Voisin grazing management of permanent pastures."** ***American Journal of Alternative Agriculture*** **1(4):147-152.**
An introduction to the Voisin grazing system is given. Forage samples were taken and dairy profitability measured on six VT grazing farms. On 3 farms where comparison was possible, net profits per cow were $67 more using MIRG than using continuous grazing the year before, due mainly to savings on feed costs.

27. Nichols, Matt and Wayne Knoblauch. 1996. "Graziers and Nongraziers Fared About the Same." ***Hoard's Dairyman*** **141(9):351.**
Selected elements of costs and profits were compared between a set of grazing and non-grazing farms in NY. When 15 graziers were matched up with 15 similar non-graziers and examined over 3 years, milk production was consistently lower but net farm income consistently higher for graziers. When those 15 graziers were compared to a non-matched group of 79 non-graziers, both milk production and net farm income were higher for graziers.

28. Noyes, T. E., M. L. Bennette and D. J. Breech. 1997. "Economic Survey of Management Intensive Grazing Dairies in Northeast Ohio." ***Forage and Grassland Conference.*** **American Forage and Grassland Council.**
The authors find that although Ohio farms using MIRG have lower gross income than non-grazing farms, they also have a higher net income due to the savings in cost of production. Net return per cow on MIRG farms was $447 and $468 for 1994 and 1995, respectively. By comparison, net return per cow for all dairy farms (including MIRG) was $400 and $429.

29. Olsen, Jim. 2004. "A Summary of Basic Costs and Their Impact on Confinement vs. Managed Intensive Rotational Grazing (MIRG)." Wisconsin Dairy Data. University of Wisconsin Center for Dairy Profitability. No. 2004-01. Madison, WI.
3 years of data on costs of production are compared between confinement and MIRG farms. MIRG farms featured significant cost savings in a number of categories, including Renting/Leasing ($87/head/yr); Other Livestock Expenses ($82/hd/yr); Depreciation of Purchased Breeding Livestock ($65/hd/yr); Purchased Feed Costs ($45/hd/yr); and Veterinary Expenses ($43/hd/yr). Overall, the MIRG farms held a $476/head/yr advantage in costs of production.

30. Rust, J.W., et al. 1995. "Intensive Rotational Grazing for Dairy Cattle Feeding." ***American Journal of Alternative Agriculture*** **10(4):147-151.**
Two groups of cows were either grazed (+ small supplementation) or confined over 2 years. Measurements of animal performance, forage quality, and profitability were taken. Confinement cows produced 7% more milk. Grazed cows produced a net return $53 and $44 greater than confinement cows in the 2 different years. Greatest cost economies resulted from reduced use of facilities and equipment and reduced labor.

31. Soriano, F.D., C.E. Polan and C.N. Miller. 2001. "Supplementing Pasture to Lactating Holsteins Fed a Total Mixed Ration Diet." ***Journal of Dairy Science*** **84:2460-2468**.
Cows were fed either TMR only, TMR+morning pasture, or TMR+afternoon pasture. Milk production was slightly higher with TMR cows. No significant differences were detected for milk fat, protein content, or body weight, but body condition was greater for TMR cows. Income-over-feed costs were 18.6% higher than TMR for afternoon grazing and 7.5% higher than TMR for morning grazing.

32. White, S.L., et al. 2002. "Milk Production and Economic Measures in Confinement or Pasture Systems Using Seasonally Calved Holstein and Jersey cows." ***Journal of Dairy Science*** **85:95-104.**
A four-year study comparing milk production and economic profitability of confinement and

pastured herds. Pastured cows produced 11% less milk, but feed costs for pastured herds averaged $0.95 less per cow per day. Significantly more confinement cows got mastitis and were culled. Overall, the tradeoff between milk yields and economic factors showed pasture-based systems to be economically competitive with confinement systems.

33. **Winsten, Jon, et al. 1995. "Economics of Feeding Dairy Cows on Well-Managed Pastures." University of Vermont. http://pss.uvm.edu/vtcrops/?Page=research/pasture/Economics.html.**
23 VT graziers in 1994 and 21 in 1995 were compared to 24 VT confinement farms which comprised the top quarter for per-cow profitability of farms using the Agrifax accounting system. Graziers earned $579 net income per cow over 2 years, while confinement farms averaged $451 per cow. Biggest savings occured in the areas of paid labor, cropping costs, repairs, and fuel.

34. **Winsten, Jonathan R., Robert L. Parsons and Gregory D. Hanson. 2000. "A Profitability Analysis of Dairy Feeding Systems in the Northeast."** ***Agricultural and Resource Economics Review*** **29(2):220-228.**
Data was obtained from a stratified random sample of 96 dairy farms in three categories: confinement, traditional grazing, and MIRG. Confinement farms had the highest milk production and milk sales, but also the highest grain expenses and veterinary expenses per cow. There were no significant differences in machinery use. Overall, confinement farms had the highest rate of return to assets (7.76%), followed by MIRG (5.83%). Traditional grazing lagged far behind.

35. **Winsten, Jonathan R. and Bryan T. Petrucci. 2003. "Seasonal Dairy Grazing: A Viable Alternative for the 21st Century." American Farmland Trust.**
The report begins by providing a good introduction to the many purported benefits of grazing, including environmental, farm labor, and farm profitability. Then case studies of six farms in four states (WI, MA, MI, PA) are presented, concentrating on farmers' histories with grazing, paddock construction, feeding practices, yields, and profitability. The farms usually achieve net incomes per unit well above their state averages, even when herd size or milk per cow is substantially lower than average.

36. **Zartman, D.L. (ed.). 1994. "Intensive Grazing/Seasonal Dairying: The Mahoning County Dairy Program." Department of Dairy Science, Ohio Agricultural Research and Development Center. OARDC Research Bulletin 1190. Wooster, OH.**
This is an exhaustive report on many elements of a 5-year grazing project conducted to assess the viability of MIRG for Ohio dairies. Consists of 12 chapters, mostly agronomy- and animal science-related. Milk production increased each year. Costs of production were found to be 27-30% below those used in conventional OH dairy budgets. Net farm income was also higher than the national dairy farm average in the year when the project sold Grade A milk.

Studies on animal and human health related to grazing

37. Bruun, J., A.K. Ersboll and L. Alban, 2002. Risk Factors for Metritis in Danich Dairy Cows. Preventive Veterinary Medicine, Volume 54, pp. 179-190.
2144 herds from 3 regions in Denmark, totally 102,060 cows. The risk for metritis was lower for cows in herds with grazing relative to cows in zero-grazing herds or in herds when cows grazed only when dry.

38. Clancy, Kate. Greener Pastures, How grass-fed beef and milk contribute to healthy eating. Union of Concerned Scientists, March 2006
http://www.ucsusa.org/food_and_environment/sustainable_food/greener-pastures.html

A comprehensive study that confirms that beef and milk from animals raised entirely on pasture have higher levels than conventionally raised beef and dairy cattle of beneficial fats that may prevent heart disease and strengthen the immune system. The study also shows that grass-fed meat is often leaner than most supermarket beef, and raising cattle on grass can reduce water pollution and the risk of antibiotic-resistant diseases.

39. Dhiman, T.R., et al. 1999. "Conjugated Linoleic Acid Content of Milk from Cows Fed Different Diets." *Journal of Dairy Science* 82:2146-2156.
This clinical trial consisted of four different experiments, each feeding a group of cows a different kind of diet. Examples include high oil diets, fish meal mixed with monensin, pasture + TMR, all pasture, and finely chopped alfalfa. Cows with all pasture and no supplements had 500% more CLA in their milk fat than cows on typical dairy diets.

40. Frankena, K., E. N. Stassen, J.P.T.M.Noordhuizen, J.O. Goelema, J. Schipper, H. Smelt, H. Romkema. Prevalence of lameness and risk indicators for dermatitis interdigitalis during pasturing and housing of dairy cattle. In: Thursfield, M.V. (Ed.), Proc. Annual Symp, Soc. Vet. Epidemiol. Prev. Med., London, pp. 107-118.
Reported effects of grazing included less severe hoof disorders and recovery from such disorders.

41. Nocek, James E., Hoof Health: Managing Cow Comfort to Reduce Lameness. Biovance technology, Omaha, NE, 2000.
Author makes recommendations for feedbunk design based on the natural behaviors or the cow and what is best for cow comfort. "When observed in her natural habitat, the cow had been adapted to eating in a natural grazing position, as in pasture. Studies have shown that cows will eat longer and produce more saliva during the eating process when they are consuming food in a grazing vs. a more horizontal position." It is a natural behavior to graze, which in turn produces more saliva, which aids in rumination.

42.G. M. Jones, Professor of Dairy Science, Extension Dairy Scientist. Milk Quality and Milking Management Proper Dry Cow Management Critical for Mastitis Control. Virginia Tech, Virginia Cooperative Extension. Publication Number 404-212, posted May 1999
Pasture has reduced the risk of environmental mastitis, but … pastures should be managed to prevent muddy areas where heifers or older cows would lie down, as exposure is increased when

cows have access to lots with limited shade trees, or pastures that are overgrazed, or grazed during periods of heavy rain.

43. Keil, N.M., T.U. Wiederkehr, K. Friedli and B. Wexchsler, 2005 (in press). Effects of Frequency and Duration of Outdoor Exercise on the Prevalence of Hock Lesions in Tied Swish Dairy Cows. Preventive Veterinary Medicine.
Exercise of long duration is generally associated with low prevalence of hock lesions, whereas frequent exercise of short duration is associated with high prevalence of lesions. "Having the cows remain outdoors for long periods of time is only possible in the case of pasture where cows move about while grazing and are also able to lie comfortably. By contrast, short periods of exercise include all occasions of being in the outdoor run where cows mainly stand and normally do not lie down due to the limited space and the inappropriate surface (mostly concrete or dirt surface, or rarely, wood shavings."

44. Strohlic, Ron. 2005 "Regulating Organic: Impacts of the National Organic Standards on Consumer Awareness and Organic Consumption Patterns" California Institute for Rural Studies (CIRS). http://www.cirsinc.org/docs/Regulating_Organic.pdf

45. C.C. Ketelaar-de Lauwere, et. al. Voluntary automatic milking in combination with grazing of dairy cows. Milking frequency and effects on behaviour. Applied Animal Behaviour Science, February 10,1999.
Cows spend 80-99.6% of their time lying when they have they have access to pasture. Lying time is a indicator of cow comfort and health. Findings support improved animal welfare. When cows had choice between indoors and outdoors, they spent most of their lying time in pasture. "Grazing seems to be advantageous for the welfare of the cows, as they clearly preferred to lie in the pasture rather than in the cubicles."

46.Murray, R.D., D.Y. Downham, M.J. Clarkson, W.B. Faull, J.W. Hughes, F.J. Manson, J.B. Merritt, W.B. Russell, J.E. Sutherst and W. R. Ward. Epidemiology of Lameness in Dairy Cattle: Descpription and Analysis of Foot Lesions. Veterinary Record 1996, Volume 138, pp. 586-591.
Study of 5000 dairy cattle found that the incidence of hoof lesions was lower for cows on grass. The incidence of hoof lesions was lower in summer when cows were grazing on pasture than it was during the winter months when cows were housed indoors.

47.C.S. Poulson, T.R Dhiman, A. L. Ure, d. Cornforth, K.C. Olson. Conjugated linoleic acid content of beef from cattle fed diets containing high grains, CLA, or raised on forages. Utah **State University. Livestock Production Science 91 (2004) 117-128**
The concentration of C 18:2 cis-9, trans-11 isomer of CLA in beef can be raised by as much as 466% by feeding forages and pasture only compared with beef from animals fed typical high-grain diets.

48.Wells, S.J., L.P. Garber and B.A. Wagner, 1999. Papillomatous Digital Dermatitis and Associated Risk Factors in US Dairy Herds. Preventive Veterinary Medicine. Volume 38, pp. 11-24.

Cows housed on dyrlots versus those on pasture were three times more likely to develop papillomatuous. The incidence of papillomatuous digital dermatitis among lactating cows housed only in drylots was 36.6% versus 10.7% for cows housed in pasture. Cows housed in pasture and drylot had a 21% incidence of PDD.