

# Feeding Herds Certified for Organic Milk Production

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## Abstract

Management of cows in certified organic dairy farms requires an understanding of organic protocols and regulations for nutritionists, veterinarians, and producers. If a dairy farmer chooses to manage his or her cows under organic guidelines, specific principles of management that are unique to organic production must be coupled with best-known traditional management practices used in non-organic herds.

## Introduction

Professional publications, consumer magazines, newspapers, and World Wide Web sights discussing the merits of organic food for human consumption are abundant. Consumer access to information about the details surrounding the food they eat, combined with ever more frequent news stories about unsafe food, has fueled an unprecedented growth in the organic food industry group. Since 1997, organic food sales have increased each year by 17 to 21% while during the same period total food sales in the US have only climbed 2 to 4%. In 2001, the organic movement in the United States was a \$7.7 billion business, and in 2006, it was at \$40 billion according to research by Organic Monitor (London, UK; <http://www.organization.com>). Dairy products are no exception to this with a 17% growth in sales of organic dairy products expected through the year 2008 (Martin, 2005). Continuing consumer demand

for organic food has milk processors clamoring for a supply of certified organic milk. Discussing the merits of this booming business is not in the scope of this paper. Instead, the focus will be on understanding organic protocols so nutritionists and veterinarians can service the needs of clients who choose to manage their dairy for production of certified organic milk.

## Discussion

Understanding organic dairy production requires some review of the organic food regulations in our country. In 1990, the U.S. Congress passed The Organic Foods Production Act as part of the Farm Bill. This act authorizes the Secretary of Agriculture to appoint a 15 member advisory committee called the National Organic Standards Board (**NOSB**). The board serves as an advisor to the Secretary of Agriculture regarding the implementation of the United States Department of Agriculture's (**USDA**) National Organic Program (**NOP**) and assisting in developing standards for materials used in organic production as listed by the NOP. The NOP regulations are a 544 page document published in the Federal Register under the direction of the Agricultural Marketing Service (**AMS**), an arm of the USDA. This national program facilitates domestic and international marketing of fresh and processed food that is organically produced, assuring consumers consistence and uniformity of production standards. Additionally, the NOP establishes a national level

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accreditation standards for the production, handling, and labeling of organically produced products. Included in these standards are lists of substances approved for and prohibited from use in organic production (See Appendix #1). For a more complete review of the NOP standards (“Rule”) the reader is urged to visit the NOP web site at <http://www.ams.usda.gov/nop/>. The portion of the NOP regulation pertaining to livestock operations is listed in Appendix #2.

Dairy herds that desire to produce certified organic milk are a key component of the United States organic food production and have a significant presence in the NOP rulings. The rulings are very comprehensive but can be reduced to saying that synthetics such as antibiotics, hormones, and pesticides are prohibited unless listed as approved. “Natural” products are acceptable unless listed as prohibited. Additionally, all feed must be purchased as certified organic and has to be grown on land free from application of manufactured fertilizer, pesticides, herbicides, and other chemicals for the prior 3 years. This certified organic feed must be fed to the herd and no prohibited substances may be used in cows producing certified organic milk. In addition to feed certification, product usage requirements are listed in the Rule pertaining to management systems and living conditions for the herd. This section in the Rule (205.239) is vague and has received a great deal of attention in organic dairy production as it pertains to pasture systems. Currently, the standards state that a producer of an organic livestock operation must establish and maintain livestock living conditions which accommodate the health and natural behavior of animals, including access to outdoors, shelter, shade, fresh air, and pasture (National Organic Program Standards, 2003). Controversy has surrounded this ruling especially as it pertains to pasture. On August 17, 2005, the NOSB offered guidance for interpretation of the USDA NOP pasture portion of *The Organic System Plan* (See Appendix #3). The NOSB’s new recommendation states that

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.

Third party certification inspectors make thorough inspections of facilities, cows, and records at least annually to determine whether they conform to the NOP standards. Those producers who comply with the regulations are *certified* by a certifying agency and allowed to use the USDA organic logo, make product statements, and sell their product as *certified organic*.

Record keeping, accountability, and integrity are an integral part of managing a certified organic dairy within NOP guidelines. Additionally, key components of an organic herd’s management include a biosecurity plan, vaccination protocols, pasture plan, sanitation and hygiene routines, reproduction program, treatment and culling strategy, and well-balanced nutrition.

It is important to understand that as stated in 205.238 (c)(7) of the NOP, it is prohibited to withhold medical treatment from a sick animal in an effort to preserve its organic status. All appropriate medications must be used to restore an animal to health when methods acceptable to organic production fail. Livestock treated with a prohibited substance must be clearly identified and shall not be sold, labeled, or represented as organically produced.

Feeding the organic dairy cow and nutritional principals associated with her wellness and productivity are no different than conventionally fed herds with one major exception. All feed ingredients must be certified organic or included in the NOP approved list of additives (See Appendix

#1). The animal nutritional requirements, ration formulation, and least cost optimization are no different than for those of conventional diets. Often the only challenge is procurement of organic certified grains and forages at an affordable cost.

## Conclusion

The economics of organic dairy production are a fine balancing act between consumer demands creating a premium farm gate milk price, the higher prices for organic feeds, a lower feed efficiency (milk:feed ratio), and the added cost of production associated with the transition years. After a producer examines all the factors impacting profitability, he or she will be in the position to choose the correct management system for their operation. If the decision is to become certified organic, then management of an organic dairy operation can be simply stated as; knowing the rules in the guidelines of the USDA's National Organic Program, staying within the boundaries of those rules even if you don't agree with them or they don't make sense to you, and finally adhering to all best known management practices of dairy production management that modern science and technology offers.

## References

Martin, A. 2005. Organic Milk Debate. Chicago Tribune. January 10 issue.

National Organic Program Standards. 2003. United States Department of Agriculture, Agricultural Marketing Services, 205.239. pages 381-382. <http://www.ams.usda.gov/nop/NOP/standards.html>

## Appendix #1

### 205.603 Synthetic substances allowed for use in organic livestock production.

In accordance with restrictions specified in this section, the following synthetic substances may be used in organic livestock production:

- a. As disinfectants, sanitizer, and medical treatments as applicable.
  1. Alcohols.
    - i. Ethanol-disinfectant and sanitizer only , prohibited as a feed additive.
    - ii. Isopropanol-disinfectant only.
  2. Aspirin-approved for health care use to reduce inflammation.
  3. Biologics-Vaccines.
  4. Chlorhexidine - Allowed for surgical procedures conducted by a veterinarian. Allowed for use as a teat dip when alternative germicidal agents and/or physical barriers have lost their effectiveness.
  5. Chlorine materials - disinfecting and sanitizing facilities and equipment. Residual chlorine levels in the water shall not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act.
    - i. Calcium hypochlorite.
    - ii. Chlorine dioxide.
    - iii. Sodium hypochlorite.
  6. Electrolytes-without antibiotics.
  7. Glucose.
  8. Glycerine - Allowed as a livestock teat dip, must be produced through the hydrolysis of fats or oils.
  9. Hydrogen peroxide.
  10. Iodine.
  11. Magnesium sulfate.
  12. Oxytocin - use in post parturition therapeutic applications.
  13. Paraciticides. Ivermectin - prohibited in slaughter stock, allowed in emergency

treatment for dairy and breeder stock when organic system plan-approved preventive management does not prevent infestation. Milk or milk products from a treated animal cannot be labeled as provided for in subpart D of this part for 90 days following treatment. In breeder stock, treatment cannot occur during the last third of gestation if the progeny will be sold as organic and must not be used during the lactation period for breeding stock.

14. Phosphoric acid - allowed as an equipment cleaner, Provided, That, no direct contact with organically managed livestock or land occurs.
- b. As topical treatment, external parasiticide or local anesthetic as applicable.
  1. Copper sulfate.
  2. Iodine.
  3. Lidocaine - as a local anesthetic. Use requires a withdrawal period of 90 days after administering to livestock intended for slaughter and 7 days after administering to dairy animals.
  4. Lime, hydrated - as an external pest control, not permitted to cauterize physical alterations or deodorize animal wastes.
  5. Mineral oil - for topical use and as a lubricant.
  6. Procaine - as a local anesthetic, use requires a withdrawal period of 90 days after administering to livestock intended for slaughter and 7 days after administering to dairy animals.
- c. As feed supplements - Milk replacers without antibiotics, as emergency use only, no nonmilk products or products from BST treated animals.
- d. As feed additives.
  1. DL - Methionine, DL-Methionine - hydroxy analog, and DL-Methionine – hydroxy analog calcium

- for use only in organic poultry production until October 21, 2005.

2. Trace minerals, used for enrichment or fortification when FDA approved.
3. Vitamins, used for enrichment or fortification when FDA approved.
- e. As synthetic inert ingredients as classified by the Environmental Protection Agency (**EPA**), for use with nonsynthetic substances or a synthetic substance listed in this section and used as an active pesticide ingredient in accordance with any limitations on the use of such substances.
  1. EPA List 4 - Inerts of Minimal Concern.

f.-z. [Reserved]

#### **205.604 Nonsynthetic substances prohibited for use in organic livestock production.**

The following nonsynthetic substances may not be used in organic livestock production:

- a. Strychnine.
- b.- z. [Reserved]

#### **205.605 Nonagricultural (nonorganic) substances allowed as ingredients in or on processed products labeled as “organic” or “made with organic (specified ingredients or food groups(s)).”**

The following nonagricultural substances may be used as ingredients in or on processed products labeled as “organic” or “made with organic (specified ingredients or food group(s))” only in accordance with any restrictions specified in this section.

- a. Nonsynthetics allowed:

Acids (Alginic; Citric - produced by microbial fermentation of carbohydrate substances; and Lactic).

Agar-agar.  
 Animal enzymes – (Rennet - animal derived; Catalase – bovine liver; Animal lipase; Pancreatin; Pepsin; and Trypsin).  
 Bentonite.  
 Calcium carbonate.  
 Calcium chloride.  
 Calcium sulfate - mined.  
 Carageenan.  
 Colors, nonsynthetic sources only.  
 Dairy cultures.  
 Diatomaceous earth - food filtering aid only.  
 Enzymes—must be derived from edible, nontoxic plants, nonpathogenic fungi, or nonpathogenic bacteria.  
 Flavors - nonsynthetic sources only and must not be produced using synthetic solvents and carrier systems or any artificial preservative.  
 Glucono delta-lactone – production by the oxidation of D-glucose with bromine water is prohibited.  
 Kaolin.  
 Magnesium sulfate, nonsynthetic sources only.  
 Nitrogen - oil-free grades.  
 Oxygen--oil-free grades.  
 Perlite—for use only as a filter aid in food processing.  
 Potassium chloride.  
 Potassium iodide.  
 Sodium bicarbonate.  
 Sodium carbonate.  
 Tartaric acid.  
 Waxes - nonsynthetic (Carnauba wax; and Wood resin).  
 Yeast - nonsynthetic, growth on petrochemical substrate and sulfite waste liquor is prohibited (Autolysate; Bakers; Brewers; Nutritional; and Smoked - nonsynthetic smoke flavoring process must be documented).

b. Synthetics allowed:

Alginates.  
 Ammonium bicarbonate - for use only as a

leavening agent.  
 Ammonium carbonate - for use only as a leavening agent.  
 Ascorbic acid.  
 Calcium citrate.  
 Calcium hydroxide.  
 Calcium phosphates (monobasic, dibasic, and tribasic).  
 Carbon dioxide.  
 Cellulose - for use in regenerative casings, as an anti-caking agent (non-chlorine bleached) and filtering aid.  
 Chlorine materials - disinfecting and sanitizing food contact surfaces, except, that, residual chlorine levels in the water shall not exceed the maximum residual disinfectant limit under the Safe Drinking Water Act (Calcium hypochlorite; Chlorine dioxide; and Sodium hypochlorite).  
 Ethylene - allowed for postharvest ripening of tropical fruit and degreening of citrus.  
 Ferrous sulfate - for iron enrichment or fortification of foods when required by regulation or recommended (independent organization).  
 Glycerides (mono and di) - for use only in drum drying of food.  
 Glycerin - produced by hydrolysis of fats and oils.  
 Hydrogen peroxide.  
 Lecithin - bleached.  
 Magnesium carbonate - for use only in agricultural products labeled “made with organic (specified ingredients or food group(s)),” prohibited in agricultural products labeled “organic.”  
 Magnesium chloride - derived from sea water.  
 Magnesium stearate - for use only in agricultural products labeled “made with organic (specified ingredients or food group(s)),” prohibited in agricultural products labeled “organic.”  
 Nutrient vitamins and minerals, in accordance with 21 CFR 104.20, Nutritional Quality Guidelines For Foods.  
 Ozone.  
 Pectin (low-methoxy).

Phosphoric acid - cleaning of food-contact surfaces and equipment only.

Potassium acid tartrate.

Potassium tartrate made from tartaric acid.

Potassium carbonate.

Potassium citrate.

Potassium hydroxide - prohibited for use in lye peeling of fruits and vegetables except when used for peeling peaches during the Individually Quick Frozen (IQF) production process.

Potassium iodide - for use only in agricultural products labeled “made with organic (specified ingredients or food group(s)),” prohibited in agricultural products labeled “organic.”

Potassium phosphate - for use only in agricultural products labeled “made with organic (specified ingredients or food group(s)),” prohibited in agricultural products labeled “organic.”

Silicon dioxide.

Sodium citrate.

Sodium hydroxide - prohibited for use in lye peeling of fruits and vegetables.

Sodium phosphates - for use only in dairy foods.

Sulfur dioxide - for use only in wine labeled “made with organic grapes,” Provided, That, total sulfite concentration does not exceed 100 ppm.

Tartaric acid.

Tocopherols - derived from vegetable oil when rosemary extracts are not a suitable alternative.

Xanthan gum.

c.- z. [Reserved]

[65 FR 80657, Dec. 21, 2000, as amended at 68 FR 61993, Oct. 31, 2003, and 68 FR 62217, Nov 3, 2003]

**205.606 Nonorganically produced agricultural products allowed as ingredients in or on processed products labeled as “organic” or “made with organic (specified ingredients or food group(s)).”**

The following nonorganically produced agricultural products may be used as ingredients in or on processed products labeled as “organic” or “made with organic (specified ingredients or food group(s))” only in accordance with any restrictions specified in this section.

Any nonorganically produced agricultural product may be used in accordance with the restrictions specified in this section and when the product is not commercially available in organic form.

- a. Cornstarch (native).
- b. Gums - water extracted only (arabic, guar, locust bean, carob bean).
- c. Kelp - for use only as a thickener and dietary supplement.
- d. Lecithin - unbleached..
- e. Pectin (high-methoxy).

## Appendix #2

### 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,
  1. Poultry. Poultry or edible poultry products must be from poultry that has been under continuous organic management beginning no later than the second day of life;
  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, That, when an entire, distinct herd is converted to organic production, the producer may:

- i. 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
  - ii. provide feed in compliance with § 205.237 for the final 3 months.
  - iii. Once an entire, distinct herd has been converted to organic production, all dairy animals shall be under organic management from the last third of gestation.
3. **Breeder stock.** Livestock used as breeder stock may be brought from a nonorganic operation onto an organic operation at any time: Provided, That, if such livestock are gestating and the offspring are to be raised as organic livestock, the breeder stock must be brought onto the facility no later than the last third of gestation.
- b. The following are prohibited:
- 1. Livestock or edible livestock products that are removed from an organic operation and subsequently managed on a nonorganic operation may be not sold, labeled, or represented as organically produced.
  - 2. Breeder or dairy stock that has not been under continuous organic management since the last third of gestation may not be sold, labeled, or represented as organic slaughter stock.
- c. The producer of an organic livestock operation must maintain records sufficient to preserve the identity of all organically managed animals and edible and nonedible animal products produced on the operation.

### **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
- 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 or 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.

### **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 need 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 synthetic medications: Provided, That, such medications are allowed under 205.603. Parasiticides allowed under 205.603 may be used on:
1. Breeder stock, when used prior to the last third of gestation but not during lactation for progeny that are to be sold, labeled, or represented as organically produced; and
  2. Dairy stock, when used a minimum of 90 days prior to the production of milk or milk products that are to be sold, labeled, or represented as organic.
- c. The producer of an organic livestock operation must not:
1. Sell, label, or represent as organic any animal or edible product derived from any animal treated with antibiotics, any substance that contains a synthetic substance not allowed under 205.603, or any substance that contains a nonsynthetic substance prohibited in 205.604.
  2. Administer any animal drug, other than vaccinations, in the absence of illness;
  3. Administer hormones for growth promotion;
  4. Administer synthetic parasiticides on a routine basis;
  5. Administer synthetic parasiticides to slaughter stock;
  6. Administer animal drugs in violation of the Federal Food, Drug, and Cosmetic Act; or

7. Withhold medical treatment from a sick animal in an effort to preserve its organic status. All appropriate medications must be used to restore an animal to health when methods acceptable to organic production fail. Livestock treated with a prohibited substance must be clearly identified and shall not be sold, labeled, or represented as organically produced.

#### **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;
  3. Appropriate clean, dry bedding. If the bedding is typically consumed by the animal species, it must comply with the feed requirements of § 205.237;
  4. Shelter 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;
- 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. Risk to soil or water quality.

- c. 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.

### Appendix #3

#### NOSB Livestock Committee Recommendation for Guidance

Pasture Requirements for the National Organic Program

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.

The NOSB is seeking comments on organic system plan requirements; temporary confinement; and what constitutes “appropriate pasture conditions.” In particular, the NOSB seeks input on specific dry matter intake from pasture language; reference to regional NRCS prescribed grazing standards; and whether or not any of the text below should be recommended to the NOP for rule change.

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

##### A. Organic system plan

Ruminant livestock shall graze pasture during the months of the year when pasture can provide edible forage. *The Organic System Plan shall have the goal of providing grazed feed greater than 30% dry matter intake on a daily basis during the growing season but not less than 120 days.*

The Organic System Plan shall include a timeline showing how the producer *will satisfy the goal to maximize* the pasture component of total feed used in the farm system. For livestock operations with ruminant animals, the operation’s Organic System Plan shall 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;
5. The records that are maintained to demonstrate compliance with pasture requirements.

##### B. Temporary confinement

Temporary confinement means the period of time when ruminant livestock are 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 shall be the minimum time necessary. In no case shall temporary confinement be allowed as a continuous production system. All instances of temporary confinement shall be documented in the Organic System Plan and in records maintained by the operation.

Temporary confinement is allowed only 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;
3. To protect soil or water quality.

C) Appropriate pasture conditions

Appropriate pasture conditions shall be determined in accordance with the regional Natural Resources Conservation Service Conservation Practice Standards for Prescribed Grazing (Code 528) for the number of animals in the Organic Systems Plan.

