



# Grass Fed Ruminant Standard



## Pro-Cert Certification Services

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| Valid<br>05/5/17 | Grass Fed Ruminant Standard<br>Grass Fed-Standard | Author: AG<br>Reviewer: CS, BJSH, JWH | Cover<br>Version 1 |
|------------------|---------------------------------------------------|---------------------------------------|--------------------|

## PREFACE

The term “Grass Fed” is not a regulated term in North America. This can lead to confusion as the term can be used to include any animal that was fed grass at some point during its life. However, the term Grass Fed within this standard is intended for ruminants that have been fed grasses, legumes, and stored forages from birth to slaughter. This is often referred to as grass fed *and* grass finished. Ruminants that are not grass finished do not produce the same quality end product with the same nutrient profile. It is important to understand the difference and to follow this Standard to ensure a healthy, flavourful product.

This Standard meets or exceeds the regulated North American organic standards. It enables Grass Fed operators to easily transition to certified organic programs moving forward.

The Pro-Cert Grass Fed Program Team is developing a similar, pasture-raised, standard for non-ruminant animals.

|                   |                             |                         |           |
|-------------------|-----------------------------|-------------------------|-----------|
| Valid<br>05/15/17 | Grass Fed Ruminant Standard | Author: AG              | Preface   |
|                   | Grass Fed-Standard          | Reviewer: CS, BJSH, JWH | Version 1 |

## TABLE OF CONTENTS

|                                                         |            |
|---------------------------------------------------------|------------|
| <b>PREFACE</b> .....                                    | <b>1-1</b> |
| <b>1 GRASS FED BENEFITS</b> .....                       | <b>1</b>   |
| 1.1 Human Health Benefits.....                          | 1          |
| 1.2 Animal Health Benefits .....                        | 1          |
| 1.3 Environmental Benefits .....                        | 2          |
| 1.4 Certification Benefits.....                         | 2          |
| <b>2 PRO-CERT’S CERTIFIED GRASS FED PROGRAM</b> .....   | <b>3</b>   |
| 2.1 Maintenance of the Standard.....                    | 3          |
| 2.2 Application of the Standard.....                    | 3          |
| 2.3 Certification.....                                  | 3          |
| 2.3 Seal Usage .....                                    | 3          |
| <b>3 GENERAL PRINCIPLES</b> .....                       | <b>3</b>   |
| <b>4 DEFINITIONS AND TERMINOLOGY</b> .....              | <b>4</b>   |
| <b>5 LIVESTOCK FEEDING</b> .....                        | <b>6</b>   |
| 5.1 General .....                                       | 6          |
| 5.2 Feed Sources .....                                  | 6          |
| 5.3 Pasture and Crop Management.....                    | 7          |
| 5.4 Young Stock.....                                    | 7          |
| 5.5 Supplements and Substances.....                     | 8          |
| 5.5.1 Supplement Usage.....                             | 8          |
| 5.5.2 Animal By-products .....                          | 8          |
| 5.5.3 Vitamins and Minerals .....                       | 8          |
| 5.5.4 Molasses.....                                     | 8          |
| 5.5.5 Other Supplements and Substances.....             | 9          |
| 5.5.6 Sprouted Grain .....                              | 9          |
| <b>6 ANIMAL CARE AND IDENTIFICATION PROTOCOLS</b> ..... | <b>9</b>   |
| 6.1 Living Conditions.....                              | 9          |
| 6.2 Weaning .....                                       | 10         |
| 6.3 Handling.....                                       | 10         |
| 6.4 Physical alteration .....                           | 10         |
| 6.5 Animal Health and Condition.....                    | 10         |
| <b>7 PARALLEL PRODUCTION</b> .....                      | <b>11</b>  |
| <b>8 RECORDS AND TRACEABILITY PROTOCOLS</b> .....       | <b>11</b>  |
| <b>9 PROCESSING</b> .....                               | <b>12</b>  |
| <b>10 LABELLING</b> .....                               | <b>12</b>  |
| <b>11 REFERENCED PUBLICATIONS</b> .....                 | <b>13</b>  |
| <b>APPENDIX A</b> .....                                 | <b>N</b>   |
| <b>PERMITTED SUPPLEMENTS AND SUBSTANCES LISTS</b> ..... | <b>N</b>   |
| Table 1 – Forage and roughage feed supplements.....     | N          |
| Table 2 – Other Substances .....                        | O          |

|                   |                                                   |                                       |                  |
|-------------------|---------------------------------------------------|---------------------------------------|------------------|
| Valid<br>05/15/17 | Grass Fed Ruminant Standard<br>Grass Fed-Standard | Author: AG<br>Reviewer: CS, BJSH, JWH | TOC<br>Version 1 |
|-------------------|---------------------------------------------------|---------------------------------------|------------------|

|          |                             |                         |           |
|----------|-----------------------------|-------------------------|-----------|
| Valid    | Grass Fed Ruminant Standard | Author: AG              | TOC       |
| 05/15/17 | Grass Fed-Standard          | Reviewer: CS, BJSH, JWH | Version 1 |

# 1 GRASS FED BENEFITS

## 1.1 Human Health Benefits

The nutrient profile of meat and animal by-products raised under Grass Fed protocols is superior to that of grain-fed animals.

Meat from Grass Fed animals is lower in total fat than meat from grain-fed animals, meaning that it also contains fewer calories. Despite this lower level of fat, meat from Grass Fed animals also contains 200-500% more omega-3 fatty acids than meat from grain-fed animals and the average ratio of omega-6:omega-3 in Grass Fed beef is 1.53:1 compared to 7.65:1 in grain-fed beef (6). The benefits of omega-3 fatty acids are well known and include reducing risk of heart disease and stroke, regulating cholesterol triglyceride levels, affecting learning and behaviour in children, aiding brain function, reducing risk of cancer, prevention and treatment of arthritis, and helping to control autoimmune disorders.

In addition to the increase in omega-3 fatty acids, meat and dairy products from Grass Fed ruminants are a superior source of conjugated linoleic acid (CLA), often containing 200-300% more CLA than products from grain-fed ruminants (6). CLA exhibits potent antioxidant activity and research suggests that it may be protective against heart disease, diabetes, and cancer.

Meat and dairy products from Grass Fed ruminants are also higher in beta-carotene (a precursor to vitamin A), B vitamins thiamine and riboflavin, and contain more of the antioxidants vitamin E, glutathione, superoxide dismutase (SOD), and catalase than products from grain-fed beef (6). These antioxidants play a key role in protecting the body's cells from oxidation. Grass Fed beef also contains higher levels of other nutrients, including zinc, iron, phosphorus, sodium, and potassium than grain-fed beef (8).

## 1.2 Animal Health Benefits

Ruminants are animals that are uniquely capable of acquiring nutrients from plant-based food through fermentation. Their stomach contains four different compartments, with unique functions, to break down roughage into usable nutrients.

Part of the demand for Grass Fed meat and dairy products is centred on the belief that animals raised for food should be given quality care, treated humanely, and provided with nutritious feed appropriate for their digestive systems and needs. Cattle easily digest grasses and legumes because they were designed to eat them. A sudden shift in the ruminant's diet from grass to grain can result in major upset to the animal's digestive system, causing the rumen to become highly acidic (ruminal acidosis) and resulting in discomfort and reduced feed intake. The shift in diet can escalate to further health problems such as lameness.

Because forage is generally lower in energy than grain, it takes longer to finish ruminants on an entirely grass/forage-based diet (often two or more years). However, this extra time not only improves the health of the animal and results in better welfare, but also results in improved flavour and a better nutrient profile.

|                   |                             |                         |           |
|-------------------|-----------------------------|-------------------------|-----------|
| Valid<br>05/15/17 | Grass Fed Ruminant Standard | Author: AG              | Page 1    |
|                   | Grass Fed-Standard          | Reviewer: CS, BJSH, JWH | Version 1 |

### 1.3 Environmental Benefits

Grass Fed ruminants benefit the environment in a number of ways. Firstly, pasture and rangeland used by producers raising Grass Fed ruminants is typically well managed through rotating pasture use, has increased biodiversity and soil fertility compared to conventional production, and improves the quality of run-off water from fields due to good management practices, which allows for better riparian zone protection. Secondly, although it takes more land to raise these animals, Grass Fed ruminants are typically raised on marginal land, or land that is not suited for crop production. This ensures efficient use of land and vegetation in the farm landscape. (9)

Thirdly, one of the most important environmental benefits to raising Grass Fed ruminants is the impact on climate change (increased CO<sub>2</sub> levels). Restoring pasture and grassland ecosystems can help to sequester this excess carbon. In fact, some research has shown that land with grazing animals on it can accrue three tons of carbon per hectare per year *more* than conventionally managed crop land. This is because grasses require regular destruction of their top leaves to promote root growth. Grassland ecology requires grazing animals to eat and step on trees and shrubs so that they will not be over-shaded. It also requires significant amounts of these animals' manure to fertilize the soil and provide organic matter that is eventually broken down into humus. The process works like this: Grasses, forbs and herbs in a field take in carbon from the atmosphere. Animals eat, fertilize, and trample these plants into the soil, where the carbon is decomposed and absorbed by soil microorganisms, thus feeding the roots of the plants. As new plants grow, the process is repeated over and over, absorbing more carbon and building better, more diverse soil. This process is called carbon sequestration. It is through this process that Grass Fed ruminant systems can mitigate the methane and other gas emissions from the animals themselves, in addition to aiding in the fight against climate change. In direct contrast to this system, carbon sequestration does not occur in feedlot systems. In fact, feeding animals in feedlots requires large amounts of grain, which are grown using tremendous amounts of fossil-fuel based fertilizers, pesticides, and farm equipment, further contributing to the increase in CO<sub>2</sub>. This is neither beneficial to the environment nor to the animals. (9,10)

Finally, in addition to carbon benefits, Grass Fed ruminants positively impact water use on-farm. These animals do not rely on irrigated crops (although some irrigated hay land may be needed to provide for animals in the winter months). Grass Fed ruminants rely primarily on rainfed grass and forage that is grown or cultivated on pastures and rangeland, which impacts local water resources significantly less than feedlot finished ruminants. Because the number of cattle per acre is low, less manure is produced and there is far less pollution (if any) from manure runoff when compared to a feedlot. There is also little to no indirect water contamination resulting from pesticides, fertilizers, growth hormones, and other feed supplements found in a feedlot system because these substances are not allowed in the Grass Fed certification program. (11)

### 1.4 Certification Benefits

Third party annual verification that ruminant animals are managed in compliance with a comprehensive Grass Fed standard ensures consumer confidence in the term "Grass Fed" on product labels. The Pro-Cert certification program is ISO 17063 compliant.

The Pro-Cert Grass Fed Program Team is developing a similar, pasture-raised, standard for non-ruminant animals.

|                   |                             |                         |           |
|-------------------|-----------------------------|-------------------------|-----------|
| Valid<br>05/15/17 | Grass Fed Ruminant Standard | Author: AG              | Page 2    |
|                   | Grass Fed-Standard          | Reviewer: CS, BJSH, JWH | Version 1 |

## 2 PRO-CERT'S CERTIFIED GRASS FED PROGRAM

### 2.1 Maintenance of the Standard

Pro-Cert Organic Systems Ltd. (Pro-Cert) owns and maintains this standard. The Pro-Cert Grass Fed Program Team review and revise this standard as needed to reflect changes in food regulations and labeling and to incorporate new information obtained from recent research and field experience.

### 2.2 Application of the Standard

This Standard applies to raw, processed, and un-processed products and by-products from ruminant animals, including dairy cattle, beef cattle, sheep, and goats.

### 2.3 Certification

Pro-Cert's Grass Fed certification program involves the annual verification of compliance through third-party inspection and evaluation. Livestock producers must maintain an updated Grass Fed production plan and accurate production medication and marketing records. Animal and product identity must be maintained in an auditable format at all times.

### 2.3 Seal Usage

Verified compliance with Pro-Cert's Grass Fed program enables the use of this seal:



## 3 GENERAL PRINCIPLES

The Pro-Cert Grass Fed Ruminant Standard supports the concept of natural living and species-appropriate diets used in livestock production. Ruminant animals, including cattle, sheep, and goats, were designed to consume a diet composed of plants. Ruminants are able to meet all nutritional needs from forage and are able to use marginal land (unsuitable for crop production) for grazing. This makes ruminants particularly suitable to diverse geographical and climatic areas.

Care must be taken in particularly cold or hilly areas, where animals are expending energy to stay warm or to navigate the land during grazing, to ensure that forage provided is nutritionally dense. All forage is not created equal and it is essential that nutrient content of a particular feed be known.

|                   |                             |                         |           |
|-------------------|-----------------------------|-------------------------|-----------|
| Valid<br>05/15/17 | Grass Fed Ruminant Standard | Author: AG              | Page 3    |
|                   | Grass Fed-Standard          | Reviewer: CS, BJSH, JWH | Version 1 |

## 4 DEFINITIONS AND TERMINOLOGY

The definitions and terminology used in this standard are consistent with those used in the Grass Fed certification industry.

### **Balage or Round Bale Silage**

A practice that involves cutting the forage crop with conventional hay harvesting equipment, allowing the forage to wilt to between 30-60% dry matter, then baling it into tight bales and wrapping them immediately to exclude oxygen and allow proper ensiling.

### **Browse**

Leaf and twig growth of shrubs, woody vines, trees, cacti, and other non-herbaceous vegetation available for animal consumption.

### **Crop Residue**

Portion of plants remaining after fruit and/or seed harvest, said mainly of grain crops such as corn stover or of small grain straw and stubble.

### **Dough Stage**

The kernel is filled with starch and is well formed. There is no milky fluid, only a rubbery, dough-like substance.

### **Forage**

Any herbaceous plant that can be grazed or harvested for feeding, with the exception of grain.

### **Forb**

Any herbaceous broadleaf plant that is not a grass and is not grass-like.

### **Grain**

Seed from cereal plants, caryopsis. Corn, wheat, rye, oats, rice, millet, sorghum, triticale, barley.

### **Green Feed**

Forage harvested and fed in the green, chopped form, generally without seed.

### **Hay**

The aerial parts of forage crops stored in the dry form for animal feeding.

### **Haylage**

Haylage is the feed produced by storing in an airtight silo of forage crop which has been dried to a moisture level of about 45-55%.

### **Legumes**

Legumes are dicots (produce two seed leaves), produce seed in a pod, have netted leaf venation, and usually have a taproot type of root system. Most legumes have the ability to interact with bacteria of the genus *Rhizobium* to fix nitrogen in nodules on their roots.

### **Milk Stage**

|                   |                             |                         |           |
|-------------------|-----------------------------|-------------------------|-----------|
| Valid<br>05/15/17 | Grass Fed Ruminant Standard | Author: AG              | Page 4    |
|                   | Grass Fed-Standard          | Reviewer: CS, BJSH, JWH | Version 1 |

In grain (seed), the stage of development following pollination in which the endosperm appears as whitish liquid that is somewhat like milk.

**Native Pasture**

Native vegetation (predominantly herbaceous) used for grazing in untilled areas. The term tame or introduced is used instead of native for pastures that include mainly non-native species.

**Pasture**

Forages which are harvested by grazing animals; an area of land with at least 75% forage cover or unbroken land on which livestock may graze at will.

**Range or Rangeland**

Land supporting indigenous vegetation that is grazed or that has the potential to be grazed and is managed as a natural ecosystem. Vegetation is predominantly grasses, grass-like plants, forbs, or shrubs.

**Roughage**

Includes pasture forages, hays, silages that contain a high percentage of fibre. It usually contains  $\geq 18\%$  crude fibre and  $\leq 70\%$  total digestible nutrients, on an air-dry basis and is typically less than 5.5% crude fat. This can include straw or other low-nutritive feeds.

**Silage**

For the purpose of this Standard, silage is forage harvested containing no grain and is cut no later than the early reproductive stage (i.e. flowering in grasses/cereal grains, tasseling in corn).

**Supplemental Feeding**

The practice of supplying feedstuffs to correct nutritional deficiencies in an animal's diet.

|                   |                             |                        |           |
|-------------------|-----------------------------|------------------------|-----------|
| Valid<br>05/15/17 | Grass Fed Ruminant Standard | Author: AG             | Page 5    |
|                   | Grass Fed-Standard          | Reviewer: CS, BJS, JWH | Version 1 |

## 5 LIVESTOCK FEEDING

### 5.1 General

5.1.1 Where possible, or during the appropriate season, livestock raised in the Pro-Cert Certified Grass Fed program must be provided with continuous access to pasture and/or browse as appropriate for the species. Animals shall be provided with at least 0.13 ha (0.33 ac)/AU. Outside of the grazing season, livestock raised in this program must be fed harvested forage or roughage (see 5.2.3).

5.1.2 The use of feed produced from GE (Genetically Engineered) or GMO (Genetically Modified Organism) seed is prohibited.

5.1.3 Proper record keeping is essential. A record/log of what feed/supplement was provided, how much was fed, and when must be kept up to date. If accidental exposure to banned feedstuffs occurs, the incident must be recorded and reported at the time of the next application or inspection.

5.1.4 Receipts, ingredient lists and/or tear tags must be provided to the inspection agency for all supplements and for all seeds planted for on farm forage production.

5.1.5 Purposeful feeding of unpermitted substances is prohibited and will result in the loss of an operator's Certified Grass Fed status.

### 5.2 Conversion of Existing Herds

5.2.1 Market animals one year of age or younger may be brought into an operator's Certified Grass Fed program from farms/ranches raising animals in accordance with a Grass Fed standard. Affidavits must be provided by the supplier for all purchased animals. Market animals over one year of age may only be brought in from Certified Grass Fed producers.

5.2.2 Animals raised for meat production must be raised under Grass Fed standards from birth. Existing breeder stock may not be marketed as Grass Fed.

5.2.3 An entire organic dairy herd may be converted to certified Grass Fed following 60 days adherence to this Standard. Following this transition period, milk may be marketed as certified Grass Fed.

5.2.4 An entire conventional dairy herd may be converted to certified Grass Fed if managed to Grass Fed Standard for a period of one year prior to the production of milk or milk products marketed as certified Grass Fed.

### 5.3 Feed Sources

5.3.1 Grasses and other roughage shall be the sole feed source consumed by ruminant animals from weaning to end of life. Animals shall not be fed grain at any time. This includes barley, corn, millet, oats, rye, rice, sorghum, triticale, and wheat.

|                   |                             |                         |           |
|-------------------|-----------------------------|-------------------------|-----------|
| Valid<br>05/15/17 | Grass Fed Ruminant Standard | Author: AG              | Page 6    |
|                   | Grass Fed-Standard          | Reviewer: CS, BJSH, JWH | Version 1 |

5.3.2 The diet may include a balance of grass (annual and perennial), forbs (legumes, Brassicas), browse (particularly necessary for goats), or cereal grain crops in the vegetative state (pre-grain formation; pre-milk stage). It is recommended that the nutrient content of each plant be determined through testing and an appropriate mix of feedstuffs be provided based on the animals' nutritional needs and stage of production.

5.3.3 Animals may be fed hay, haylage, silage without grain, forage products, crop residue without grain, greenfeed harvested prior to the milk stage, and other roughage sources while on pasture as well as when off pasture as the season permits.

## 5.4 Pasture and Crop Management

5.4.1 No synthetic herbicides or pesticides are allowed on perennial or annual pastures or crops harvested as stored feed.

5.4.2 All operators shall have a written pasture management and grazing plan that supports biological diversity, natural resources and soil fertility. Grass Fed ruminants must graze pasture throughout the entire grazing season. The number of grazing days will differ depending on climate and geographical location.

5.4.3 Excluding management procedures such as sorting, weaning, transporting, dehorning/branding, etc., animals may only be prevented from accessing pasture (during appropriate seasons) during severe weather or emergencies that threaten their welfare.

5.4.4 Animals may be managed under a variety of grazing/foraging protocols, including rangeland, strip grazing, or in large penned areas provided that appropriate forage cover of at least 75% ground cover is maintained. Animals shall not be confined in small paddocks, feedlots, or Concentrated Animal Feeding Operations (CAFO).

5.4.5 Grazing of harvested grain fields is permitted if at least 75% of the field is in vegetative re-growth and the average height of the re-growth is at least 8”.

5.4.6 Grazing or harvesting a grain or cereal crop once it has set seed is prohibited. However, incidental consumption of small amounts of seed from a cereal grain naturally attached to herbage, forage, and browse may occur.

## 5.5 Young Stock

5.5.1 Young, unweaned animals shall be provided with milk until weaning and provided with either pasture access or forage free choice from 7 days of age. Calves raised away from their mothers must receive at least 8 litres of milk per day until weaning. It is recommended that a step-down weaning strategy be used (gradual addition of water to the milk over a period of several days until complete replacement of milk with water is achieved).

5.5.2 Newborn dairy animals that are removed from their mothers must be given high-quality colostrum within 6 hours of birth and should be provided with high-quality milk and forage to meet nutrient needs until weaning.

|                   |                             |                         |           |
|-------------------|-----------------------------|-------------------------|-----------|
| Valid<br>05/15/17 | Grass Fed Ruminant Standard | Author: AG              | Page 7    |
|                   | Grass Fed-Standard          | Reviewer: CS, BJSJ, JWH | Version 1 |

## 5.6 Supplements and Substances

### 5.6.1 Supplement Usage

5.6.1.1 Animals may be fed approved supplements during periods of low forage quality or inclement weather (i.e. extreme cold) in order to ensure good welfare. Provided these conditions are met, provision of approved supplements shall not exceed 0.625% of body weight per day (25% total daily intake) and 1% of lifetime intake when calculated on a dry matter basis. See Appendix A for Approved Supplements List.

5.6.1.2 Dairy animals may be fed approved supplements at a rate of 0.5% body weight (20% total daily intake) during the growth stage and 0.75% of body weight (30% total daily intake) during lactation. Supplement levels are calculated on a dry matter basis. Supplements may be provided to dairy animals during milking time as an enticement year round provided that the quantity does not exceed the limit set out above.

5.6.1.3 Supplements must be approved by Pro-Cert in advance or be listed in Appendix A of this Standard. Ingredient lists and/or nutrient profiles must be retained from any supplements provided and available for inspection.

### 5.6.2 Animal By-products

5.6.2.1 No animal by-products shall be fed at any time to animals marketed under this Standard. This includes, but is not limited to, meat and bone meal, blood meal, fish meal, feather meal. The only exception to this prohibition is whey or other dairy products.

### 5.6.3 Vitamins and Minerals

5.6.3.1 Approved mineral and vitamin supplements shall be provided free choice as needed to balance the diet.

### 5.6.4 Molasses

5.6.4.1 Molasses may be used as a carrier in mineral or vitamin blocks and tubs. It may also be used as a binder or ingredient in pellet or cube products listed above.

5.6.4.2 Animals may not be fed grain by-product-based protein tubs. Any tub or block that lists a protein % first on its guaranteed analysis tag is considered to be a protein tub. A mineral block or tub must have two of the first three ingredients on the product label listed as a mineral or source of a mineral and may not be plant protein or other sources of protein, grain, or processed grain by-products.

5.6.4.3 Animals can be supplemented with molasses-based protein blocks or tubs with a targeted daily intake of up to 3 pounds (chemically hardened or cooked blocks/tubs). Such blocks/tubs are

5.6.4.4 Used to supplement low quality forages and maintain nutrient balance in the finishing diet. Animals must not be fed molasses blocks or tubs with a targeted daily intake of more than 3 pounds.

|                   |                             |                         |           |
|-------------------|-----------------------------|-------------------------|-----------|
| Valid<br>05/15/17 | Grass Fed Ruminant Standard | Author: AG              | Page 8    |
|                   | Grass Fed-Standard          | Reviewer: CS, BJSH, JWH | Version 1 |

## 5.6.5 Other Supplements and Substances

There are some supplements and substances that are permitted under this Grass Fed Standard. See Appendix A for a complete list.

5.6.5.1 Forage and roughage supplements include supplements that are derived from plant material. These are listed in Appendix A, section 1.

5.6.5.2 There are other substances that are permitted under this Standard, such as vaccines and parasiticides. These are listed in Appendix A, section 2.

## 5.6.6 Sprouted Grain

5.6.6.1 Whole sprouted grains are prohibited as the root portion of the sprout contains a significant amount of starch content. However, sprouts without the root portion are an allowable form of forage.

# 6 ANIMAL CARE AND IDENTIFICATION PROTOCOLS

## 6.1 Living Conditions

6.1.1 Animals shall be provided with appropriate housing and pasture conditions. Operators must ensure that animals have freedom of movement, exercise, and reduced stress environments.

6.1.2 Animals housed outside must have access to shade, shelter, fresh air and clean drinking water on a daily basis. Pastures, paddocks and shelter must be large enough to allow all animals to graze/feed without crowding or competition for food.

6.1.3 Animals shall not be kept in confinement. Dairy animals shall not be tethered except during milking.

6.1.4 If dairy cattle are raised in barns, operators must ensure that they provide at least one stall per animal. Electric trainers are prohibited.

6.1.5 Notwithstanding 6.1.3, existing tie stall barns may be used for lactating dairy cows, and for a period of one month for the training heifers raised in loose housing. Tie stalls are prohibited in new construction and major renovations.

- a) If tie stalls are used during the winter season, dairy cows shall have an exercise period everyday whenever possible, or at least twice a week.
- b) Tethered cows shall have an exercise period everyday, with access to pasture during the grazing season.
- c) There shall be no tethering of heifers or dry cows.

6.1.6 Individually housed dairy calves must not be tethered, have adequate space to turn, lie down, get up, and rest, and must be able to see, smell, and hear other calves. Pens shall be a minimum of 2.5 m<sup>2</sup> and a width of 1.5 m.

|                   |                             |                         |           |
|-------------------|-----------------------------|-------------------------|-----------|
| Valid<br>05/15/17 | Grass Fed Ruminant Standard | Author: AG              | Page 9    |
|                   | Grass Fed-Standard          | Reviewer: CS, BJSH, JWH | Version 1 |

6.1.7 Dairy calves are not to be housed individually past 3 months of age.

6.1.8 Dairy animals less than 6 months of age are exempt from pasture and outdoor requirements.

## **6.2 Weaning**

6.2.1 Calves shall not be weaned prior to 90 days of age. However, weaning up to 9-10 months of age is encouraged, as this is the natural timeframe for weaning in ruminants.

## **6.3 Handling**

6.3.1 Low-stress handling of animals during routine procedures must be done. These procedures include dehorning, castration, branding, weaning, sorting, and transporting.

6.3.2 Electric cattle prod use is prohibited except in instances to prevent risk of injury to the animal or handler.

## **6.4 Physical alteration**

6.4.1 Physical alterations of animals, including dehorning, castration, and branding, must be carried out in a manner that minimizes pain, stress and suffering. These procedures must be conducted with consideration to use of anaesthetics, sedatives and non-steroidal anti-inflammatory analgesics, such as lidocaine, xylazine, and ketoprofen. Operators should refer to the requirements set out in the applicable Code of Practice (nfacc.ca).

6.4.2 Dehorning and castration shall occur within 10 days of birth using an acceptable method as outlined in the applicable Code of Practice (nfacc.ca).

6.4.3 Tail docking of cattle is prohibited.

## **6.5 Animal Health and Condition**

6.5.1 Certified Grass Fed animals shall not be fed or injected with antibiotics or hormone products of any kind (including sub-therapeutic or therapeutic use and ionophores).

6.5.2 Notwithstanding 4.11, prompt treatment of detectable disease, lesions, lameness, injury, and illness is essential. Treatment must not be withheld to maintain Certified Grass Fed status. Instead, ill or injured animals must be treated accordingly and in a timely manner to minimize suffering. If prohibited medications are required for treatment, the animal must be identified and tracked throughout production. Records must be kept to prove that treated animals are not marketed under the Certified Grass Fed program.

6.5.3 Vaccines may be used.

|                   |                             |                         |           |
|-------------------|-----------------------------|-------------------------|-----------|
| Valid<br>05/15/17 | Grass Fed Ruminant Standard | Author: AG              | Page 10   |
|                   | Grass Fed-Standard          | Reviewer: CS, BJSH, JWH | Version 1 |

6.5.4 The operator must develop and maintain a written or electronic herd health plan including record of all vaccines, medications, or other substances used in the operator's herd health program. This record shall be available for review at the annual inspection.

6.5.5 Parasiticides are prohibited in slaughter stock but allowed in emergency treatment for dairy and breeder stock when preventative measures do not prevent infestation. Milk or milk products from a treated animal cannot be marketed under the Grass Fed program until 90 days following treatment. In breeder stock, treatment cannot occur during the last third of gestation if the progeny will be sold as Grass Fed and must not be used during the lactation period of breeding stock. Grass Fed ruminant operations must have comprehensive plans to minimize internal parasite problems in livestock. The plan will include preventive measures such as pasture management, fecal monitoring, and emergency measures in the event of a parasite outbreak.

6.5.6 Ninety percent (90%) or more animals on the operation will meet minimum body condition scores. Cattle, dairy and beef, must maintain a body condition score of 2.5 or higher on the 5-point scale (4 or higher on the 9-point scale). Sheep and goats must maintain a body condition score of 2.5 or higher on the 5-point scale. Bison must maintain a body condition score of 3 or higher on the 5-point scale.

## **7 PARALLEL PRODUCTION**

7.1 Parallel production under this Standard is the simultaneous production of Grass Fed ruminants and non-grass fed ruminants (i.e. grain fed) resulting in the same or similar, visually indistinguishable product(s).

7.2 Parallel production is permitted under this standard provided that the provisions set out in 5.3 and 5.4 are adhered to.

7.3 The operator shall clearly demonstrate that the identity of individual animals and products from same can be maintained during their production, harvest, storage, processing, packaging and marketing.

7.4 The operator shall maintain verifiable, accurate records of both Grass Fed and non-grass fed animals during production and products during storage, transportation, processing and marketing.

## **8 RECORDS AND TRACEABILITY PROTOCOLS**

8.1 Traceability of animals marketed under the Certified Grass Fed program is essential. Animals must be traceable to the farm or ranch from which they originated by written or electronic record. Traceability must be maintained from birth to harvest.

8.2 Operators must develop and maintain an animal identification system with the ability to identify each animal. Individual numbering via ear tag is considered ideal.

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|-------------------|-----------------------------|------------------------|-----------|
| Valid<br>05/15/17 | Grass Fed Ruminant Standard | Author: AG             | Page 11   |
|                   | Grass Fed-Standard          | Reviewer: CS, BJS, JWH | Version 1 |

8.3 Complete records must be maintained and up to date at all times. These records will identify all animals purchased, raised, or sold as part of the Certified Grass Fed program. Records for animals purchased must show the source farm and include any relevant information on origin.

8.4 All records shall be maintained for a minimum of 5 years after the animals is sold or harvested.

8.5 An operator's record-keeping system must provide sufficient detail and information to demonstrate compliance with this Standard. All records must be available for review.

8.6 An audit will be done during the annual inspection to ensure compliance with this Standard. Sufficient recordkeeping will enable this process to run smoothly.

## 9 PROCESSING

9.1 Grass Fed ruminants and products there from must be processed in accordance with provincial, state, and federal laws and regulations.

9.2 All dairy or meat ingredients in a Grass Fed labeled product must be sourced from certified Grass Fed animals.

9.3 All ingredients in multi-ingredient products must be produced without GE/GMO technology.

9.4 All food additives and processing aids must be produced without GE/GMO technology.

## 10 LABELLING

10.1 Any dairy animals that will eventually be marketed as Certified Grass Fed beef must meet the Pro-Cert Grass Fed Ruminant Standard.

10.2 The operator shall submit all labels and advertising materials displaying the Pro-Cert Certified Grass Fed logo to Pro-Cert for review before use.

10.3 The Certified Grass Fed label may only be used on products produced in compliance with and certified under the Pro-Cert Certified Grass Fed program.

10.4 Certified Grass Fed labels on multi-ingredient products may only be used when all dairy or meat products within the product are sourced from certified Grass Fed animals. This excludes incidental ingredients.

10.5 Certification will be renewed annually.

|                   |                             |                         |           |
|-------------------|-----------------------------|-------------------------|-----------|
| Valid<br>05/15/17 | Grass Fed Ruminant Standard | Author: AG              | Page 12   |
|                   | Grass Fed-Standard          | Reviewer: CS, BJSH, JWH | Version 1 |

## 11 REFERENCED PUBLICATIONS

1. American Grass Fed Association Grass Fed and Grass Pastured Ruminant Standards
2. PCO 100% Grass Fed Certification Manual
3. Animal Welfare Approved Certified Grass Fed standard
4. Wisconsin Grass-Fed Beef Cooperative Production Protocol
5. Thousand Hills Cattle Company 100% Grass Fed Beef program
6. Daley, C.A., A. Abbott, P.S. Doyle, G.A. Nader, and S. Larson. 2010. A review of fatty acid profiles and antioxidant content in grass-fed and grain-fed beef. *Nutr. J.* 9:10
7. Duckett, S.K., J.P.S. Neel, J.P. Fontenot, and W.M. Clapham. 2009. Effects of winter stocker growth rate and finishing system on: III. Tissue proximate, fatty acid, vitamin, and cholesterol content. *J. Anim. Sci.* 87:2961-2970.
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9. <https://landinstitute.org/wp-content/uploads/2007/08/Glover-et-al-2007-Sci-Am.pdf>
10. <https://www.greenbiz.com/article/rise-soil-carbon-cowboys>
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|-------------------|-----------------------------|-------------------------|-----------|
| Valid<br>05/15/17 | Grass Fed Ruminant Standard | Author: AG              | Page 13   |
|                   | Grass Fed-Standard          | Reviewer: CS, BJSH, JWH | Version 1 |

## APPENDIX A

### PERMITTED SUPPLEMENTS AND SUBSTANCES LISTS

Meat animals: may be fed approved supplements during periods of low forage quality or inclement weather (i.e. extreme cold) in order to ensure good welfare. Provided these conditions are met, provision of approved supplements to meat animals shall not exceed 0.625% of body weight per day (25% total daily intake) and 1% of lifetime intake when calculated on a dry matter basis.

Dairy animals: may be fed approved supplements at a rate of 0.5% body weight (20% total daily intake) during the growth stage and 0.75% of body weight (30% total daily intake) during lactation. Supplement levels are calculated on a dry matter basis.

**Table 1 – Forage and roughage feed supplements**

| Substance name(s)          | Origin and usage                                 |
|----------------------------|--------------------------------------------------|
| Alfalfa, cubes and pellets | Non-GMO sources<br>Cubes, pellets                |
| Almond                     | Hulls, hull pellets, or cubes                    |
| Beet pulp, dry             |                                                  |
| Canola                     | Non-GMO sources<br>Seed or meal                  |
| Corn                       | Non-GMO sources<br>Cobs only                     |
| Cottonseed                 | Non-GMO sources<br>Hulls, hull pellets, or cubes |
| Flax                       | Seed, seed meal, seed pellets, or cubes          |
| Forage                     | Cubes                                            |
| Grass                      | Cubes or pellets                                 |
| Kelp                       |                                                  |
| Linseed                    | Seed or meal                                     |
| Oats                       | Non-GMO sources<br>Hulls or hull pellets         |
| Peanut                     | Hulls, hull pellets, or cubes                    |

| <b>Substance name(s)</b> | <b>Origin and usage</b>                                                                                                                                                                            |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Soybean                  | Non-GMO sources<br>Seed or meal                                                                                                                                                                    |
| Sugar Products           | Non-GMO sources<br><br>May be fed up to 4 lbs/head/day<br><br>Beet pulp, whole beets, ground or sliced whole beets or citrus pulp may be fed at a level no greater than 2% of body weight per day. |
| Sunflower                | Seed, meal, meal pellets, or cubes                                                                                                                                                                 |

**Table 2 – Other Substances**

| <b>Substance name(s)</b>    | <b>Origin and usage</b>                                                                                                                                                            |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Acids for water treatments  | Non-synthetic acids may be used on farm to neutralize the pH of livestock drinking water.                                                                                          |
| Activated charcoal          | Shall be of plant origin.                                                                                                                                                          |
| Alcohol, ethyl or isopropyl | Permitted as a disinfectant.                                                                                                                                                       |
| Antibiotics                 | Not permitted under this standard.                                                                                                                                                 |
| Anti-inflammatories         | Such as ketoprofen<br>May be given to reduce inflammation following a physical alteration (eg. dehorning)                                                                          |
| Botanical compounds         | Botanical preparations, such as atropine, butorphanol and other medicines from herbaceous plants shall be used according to label specifications                                   |
| Calcium borogluconate       | For milk fever. No withdrawal period required.                                                                                                                                     |
| Chlorhexidine               | For surgical procedures conducted by a veterinarian. To be used as a post-milking teat dip when alternative germicidal agents and physical barriers have lost their effectiveness. |
| Diatomaceous earth          | For use in control of external parasites.                                                                                                                                          |

| <b>Substance name(s)</b>           | <b>Origin and usage</b>                                                                                                                                                                                                    |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electrolytes                       | Including, but not limited to: CMPK (Calcium, Magnesium, Phosphorus, Potassium), calcium propionate and calcium sulphate. Shall not contain antibiotics.<br><br>Orally or by injection.                                    |
| Homeopathy and biotherapies        |                                                                                                                                                                                                                            |
| Hydrogen peroxide                  | Pharmaceutical grade hydrogen peroxide is permitted for external use (disinfectant).<br><br>Food-grade hydrogen peroxide is permitted for internal use (for example, added to livestock drinking water)                    |
| Iodine                             | As a topical disinfectant (teat dip): permitted iodine sources include potassium iodide and elemental iodine.                                                                                                              |
| Iron products                      | May be supplied by ferric phosphate, ferric pyrophosphate, ferrous lactate, ferrous sulphate, iron carbonate, iron gluconate, iron oxide, iron phosphate, iron sulphate or reduced iron.                                   |
| Local anesthetics                  | Such as lidocaine.<br><br>Use shall be followed by withdrawal periods of 90 days for livestock intended for slaughter and seven days for dairy animals.                                                                    |
| Magnesium sulphate                 | Mined sources. A source of magnesium and sulphur.                                                                                                                                                                          |
| Minerals, trace minerals, elements | Non-synthetic chelated or sulphated minerals. Examples include oyster shell, calcium chloride and magnesium oxide.<br><br>Synthetic nutrient minerals may be used if non-synthetic sources are not commercially available. |
| Oxytocin                           | For post-parturition therapeutic use. A withdrawal period of twice the label requirement or 14 days, whichever is longer, shall be observed.                                                                               |

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|-------------------|-----------------------------|------------------------|------------|
| Valid<br>05/15/17 | Grass Fed Ruminant Standard | Author: AG             | Appendix A |
|                   | Grass Fed-Standard          | Reviewer: CS, BJS, JWH | Version 1  |

| <b>Substance name(s)</b> | <b>Origin and usage</b>                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Parasiticides            | <p>Observation of animal or fecal test results must indicate infection</p> <p>Observe withdrawal times of twice the label requirement or 14 days, whichever is longer</p> <p>Meat animals less than 12 months of age shall receive only one treatment. Older meat animals shall receive a maximum of two treatments.</p> <p>Dairy animals shall receive a maximum of two treatments in a 12-month period.</p> |
| Physical teat seals      | <p>Synthetic and non-synthetic ingredients are permitted. Shall be free from antibiotics.</p> <p>For post-lactation use. Shall be completely removed prior to nursing or milking.</p> <p>Shall be prescribed and administered under veterinary supervision.</p>                                                                                                                                               |
| Plant oils               | To control external parasites.                                                                                                                                                                                                                                                                                                                                                                                |
| Prebiotics               |                                                                                                                                                                                                                                                                                                                                                                                                               |
| Probiotics               | Administered orally, as dietary supplements, via pharmaceutical preparations in the form of capsules, tablets, alginate gels, or dry powder.                                                                                                                                                                                                                                                                  |
| Selenium products        | <p>Derived from sodium selenate or sodium selenite.</p> <p>May be used to address documented deficiencies in the stock, soils, or feed supplies.</p>                                                                                                                                                                                                                                                          |
| Sodium hydroxide         | For use in dehorning paste.                                                                                                                                                                                                                                                                                                                                                                                   |
| Sulphur                  | For control of external parasites.                                                                                                                                                                                                                                                                                                                                                                            |
| Vaccines                 | Non-GMO sources                                                                                                                                                                                                                                                                                                                                                                                               |
| Vitamins                 | <p>Vitamin formulants that comply with Canadian regulations are accepted.</p> <p>Orally, topically or by injection.</p>                                                                                                                                                                                                                                                                                       |

Adapted from CAN/CGSB-32.311-2015 pg. 19-21

|                   |                             |                         |            |
|-------------------|-----------------------------|-------------------------|------------|
| Valid<br>05/15/17 | Grass Fed Ruminant Standard | Author: AG              | Appendix A |
|                   | Grass Fed-Standard          | Reviewer: CS, BJSH, JWH | Version 1  |