NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

FEED MANAGEMENT

CODE 592
(NO. OF SYSTEMS AND AUs AFFECTED)

DEFINITION

Manipulating and controlling the quantity and quality of available nutrients, feedstuffs, or additives fed to livestock and poultry.

PURPOSE

- Improve feeding efficiency in a manner that facilitates and contributes to the conservation of natural resources.
- Reduce the quantity of nitrogen, phosphorus, sulfur, salts, and other nutrients excreted in the manure.
- Reduce the quantity and viability of pathogens in manure.
- Reduce odor, particulate matter, and greenhouse gas (GHG) emissions production from animal feeding operations.

CONDITIONS WHERE PRACTICE APPLIES

- Livestock and poultry operations with a whole farm nutrient imbalance, with more nutrients imported to the farm than are exported and/or utilized by cropping programs.
- Livestock and poultry operations that have a significant accumulation of nutrients in the soil.
- Livestock and poultry operations that land-apply manure and do not have a land base large enough to allow nutrients to be applied at rates recommended by soil test and utilized by crops in the rotation.
- Livestock and poultry operations seeking to improve nutrient use efficiencies.
- Livestock and poultry operations seeking to reduce manure pathogens.
- Livestock and poultry operations seeking to reduce odors and/or Greenhouse Gases (GHGs) from their manure.

CRITERIA

General Criteria Applicable to All Purposes

Sufficient nutrients shall be supplied to maintain the health, growth, production, performance, and reproduction of livestock and poultry.

The diets for specific species of animals shall be developed in accordance to recommendations from one of the following:

- The most current recommendations of the National Research Council (NRC).
- Recommendations of the University of Wisconsin.
- Science based standards developed by professional nutritionists of livestock and poultry production companies, feed companies, and/or feed suppliers accepted by NRCS.

Laboratory analysis shall be done on the formulated diet, or on the feed ingredients used to formulate the diet, to determine its nutrient content.

Feed and manure analyses shall be conducted by laboratories whose tests are accepted by the University of Wisconsin and the Wisconsin Department of Agriculture.

Data from analyzed feed ingredients and/or appropriate historic feed analysis information for the operation will be used for adjustments of ration formulation.

Diets and feed management strategies shall be developed by professional animal scientists, independent professional nutritionists, or other comparatively qualified individuals.

Diets shall be formulated to provide the quantities and correct relative ratios of available nutrients required by animal species to meet the goals for which the plan is being developed.

Adjustments to nutrient levels shall be provided to meet specific genetic potential environmental demands, and/or requirements to insure health, well-being, and productivity of the animal.

One or more of the following feed management practices and/or diet manipulation technologies shall be used to reduce N, P, other excreted nutrients, pathogens, odors, and/or GHGs, while maintaining the health, well-being and productivity of the animal by:

- Formulating diets closer to animal requirements.
- Reducing protein and supplementing with amino acids (non-ruminants).
- Manipulating the crude protein and energy (carbohydrate and fat) content of the diet to enhance the availability of amino acids (ruminants).
- Using highly digestible feeds and forages, as appropriate, in the diet.
- Using phytase and reducing supplemental phosphorus content of the diet (non-ruminants).
- Reducing the phosphorus content of the diet of ruminants when phosphorus is being overfed.
- Using scientifically supported and environmentally benign growth promotants and additives as allowed by law.
- Implement phase feeding.
- Implement split-sex feeding.
- Using other feed processing, management, or diet manipulation technologies that have demonstrated the ability to reduce manure nutrient content, pathogens, odors, or GHGs.

- When livestock are obtaining their diet by grazing pastures, as well as mechanically harvested and processed feeds, pasture forages will be tested for nutrient content and accounted for in the feed ration and balance of nutrients. All feeds, including grazed pasture will be included in an analysis for meeting the livestock's nutritional requirements and avoiding excess nutrients being fed. Forage tests will meet the University of Wisconsin acceptance and certification process.

Use scientifically supported and environmentally benign growth promotants and additives as allowed by law.

Use other feed processing, management, or diet manipulation technologies that have demonstrated the ability to reduce manure nutrient content, pathogens, odors, or GHGs.

CONSIDERATIONS

- Feed management can improve net farm income by feeding nutrients more efficiently.
- Consider nutrient requirements for production based upon stage of growth, intended purpose of the animal and the type of production (e.g., meat, milk, eggs) involved.
- Use management practices described in the NRCS Nutrient Management (Feed Management) Technical Notes for the specific animal species (see reference section).
- Consider different feed ingredients (e.g. by- products) and their potential impacts on the nutrient content of excreted manure.
- Consider the potential impact of feed management on the volume of manure excreted and on manure storage requirements.
- Consider the impact of feed management practices and diet manipulation on manure odors, pathogens, GHGs, dust, animal health and well-being even if one or more of these are not included in the client's objectives.
- Consider using concentrates and forages grown on the farm to minimize the quantity of nutrients imported to the farm, and to maximize the recycling of nutrients on the farm.
- Analyze freshly excreted manure to determine manure nutrient content and to estimate the impact of the feeding strategy.

PLANS AND SPECIFICATIONS

Plans and specifications for feed management shall be in keeping with the requirements of this standard. They shall describe the specific feed management practices and/or technologies that are planned for the operation.

The following components shall be included in the feed management plan:

- The type of technology, or technologies, and/or feeding practices that will be used on the operation.
- Feed analyses and ration formulation information prior to and after implementation of feed management on the operation and their intended outcome.
- The estimated, or measured nutrient content of the manure prior to the implementation of feed management on the operation.
- Records of any manure analysis that was done after the feeding strategy was implemented to determine manure nutrient content.
- Protocols for sampling and preserving feed ingredients, manure, and water, as applicable, prior to sending for analysis.

- The estimated impact that feed management will have on manure nutrient content.
- The expected impact on pathogen content, odor, and GHG reduction of manure.
- The quantities and sources of nitrogen and phosphorus that will be fed.
- Identification of the qualified feed management specialist who developed the plan.
- Guidance for how often the feed management plan shall be reviewed and potentially revised.

OPERATION AND MAINTENANCE

The producer/client is responsible for the operation and maintenance of the feed management plan. Operation and maintenance activities shall address the following:

- Periodic plan review to determine if adjustments or modifications are needed.
- Routine feed analysis to document the rates at which nitrogen and phosphorus were actually fed. When actual rates fed differ from or exceed the planned rates, records will indicate the reasons for the differences.
- Records shall be maintained to document plan implementation. As applicable, records include:
    - Feed analysis and ration formulation, including the record of ration formulation used prior to implementing the feeding strategy.
    - Records estimating the impact the feeding strategy is having on reducing manure nutrient content.
    - Manure analysis that was done after the feeding strategy was implemented to determine manure nutrient content.
    - Dates of review and person performing the review, and any recommendations that resulted from the review.
- Records of plan implementation shall be maintained for five years, or for a period longer than five years if required by other Federal, tribal, state, or local ordinances, program, or contract requirements.

FEDERAL, TRIBAL, STATE, AND LOCAL LAWS

Users of this standard should be aware of potentially applicable federal, tribal, state and local laws, rules, regulations or permit requirements governing feed management. This standard does not contain the text of federal, tribal, state, or local laws.

REFERENCES

National Academy of Sciences Animal Nutrition Reports. http://dels.nas.edu/Agriculture/Animal-Nutrition/Reports-Academies-Findings

USDA-NRCS, and USDA-ERS. 2000. Manure Nutrients Relative to the Capacity of Cropland and Pastureland to Assimilate Nutrients. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/dma/?&cid=nrcs143_014126

USDA-NRCS. 2003. Nutrient Management Technical Note #1 – Effects of Diet and Feeding Management on Nutrient Content of Manure

USDA-NRCS. 2003. Nutrient Management Technical Note # 4 – Feed and Animal Management for Poultry.

USDA-NRCS. 2003. Nutrient Management Technical Note #2 – Feed and Animal Management for Beef Cattle.

USDA-NRCS. 2003. Nutrient Management Technical Note #3 – Feed and Animal Management for Swine (Growing and Finishing)

USDA-NRCS. 2003. Nutrient Management Technical Note #5 – Feed and Animal Management for Dairy Cattle

University of Wisconsin-Extension (UWEX) Publication A3769, Recommended Methods of Manure Analysis, 2003.

USDA, NRCS, Wisconsin Field Office Technical Guide (FOTG), Section IV, Practice Standards and Specifications.

USDA, NRCS, Wisconsin Conservation Practice Standard 590 Nutrient Management

USDA, NRCS, Wisconsin Conservation Planning Technical Note WI-1, Companion Document to NRCS FOTG Standard 590, Nutrient Management.

USDA, NRCS, Wisconsin Job Sheet 592, Feed Management, Feed Management Documentation Worksheet and Checklist.