A National Feed Management Education Program
Designed to Impact Manure Composition
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Abstract. In 2006 the feed management education project was implemented for the species of beef, dairy, poultry and swine. The project is national in scope and funded by the USDA - Natural Resources Conservation Service (NRCS) Conservation Innovation Grant program. The project is designed to encourage adoption of the NRCS Feed Management Conservation Practice Standard 592 and feed management practices that can have a positive impact on soil, water, and air quality. A goal of the project is to assist NRCS staff and agricultural professionals increase their understanding of Feed Management, its impacts on environmental sustainability of livestock and poultry operations, and inclusion of a Feed Management Plan (FMP) as part of a comprehensive nutrient management plan (CNMP). The Feed Management curriculum is organized in a four-hour format for both technical service providers and nutrition consultants. Information is provided that links the FMP to the CNMP and the requirements for certification to write a feed management plan. Real farm case studies are used to provide training in use of on-farm assessment checklists for assessing the opportunity of a Feed Management Plan to impact whole farm nutrient balance; and, develop and implement a FMP. Electronic decision aid tools include: whole farm balance, manure excretion estimator, and the relative economics of a ration change vs. transporting manure. The manure excretion estimator tool and economics tool are both linked to feed nutrient use. Examples of a FMP template are provided, as well as a completed FMP.

Keywords: extension, feed management, manure, soil and water and air quality, comprehensive nutrient management plan

Introduction
This paper will provide an understanding of a national education project that has been funded by the USDA-Natural Resources Conservation Service. The primary goal is to develop a systematic approach for consultants and advisers to assist owners and managers of livestock and poultry operations in adoption of feed management practices that will be profitable and contribute to protection of the environment. The project team has developed the infrastructure to implement NRCS’s Feed Management Practice Standard 592 which is defined as “managing the quantity of available nutrients fed to livestock and poultry for their intended purpose”. Integration of Feed Management into whole farm nutrient management is a new approach that can assist livestock and poultry producers with avoiding excess accumulation of nutrients on their farm, particularly nitrogen and phosphorus.

Feed represents the largest import of nutrients to most livestock and poultry farms, followed by commercial fertilizer (Klopfenstein at al., 2002). Feed Management opportunities currently exist to reduce imports of nutrients, particularly nitrogen and phosphorus, to most animal and livestock operations. The
technologies and approaches to achieve these reductions vary in their degree of economic feasibility and environmental impact. It is important that agricultural professionals understand the degree of success that can be expected both from an economic and an environmental standpoint.

**Statement of Problem**

The US Environmental Protection Agency (EPA) released new regulations for Concentrated Animal Feeding Operations and Animal Feeding Operations (CAFO/AFO) in 2003. Under the new regulations, permitted CAFO/AFO’s will be required to develop a Nutrient Management Plan (NMP). One form of a NMP is a Comprehensive Nutrient Management Plan (CNMP) as defined by the Natural Resources Conservation Service. There are six core elements of a CNMP (see figure 1): 1) Feed Management, 2) Manure and Wastewater Handling and Storage, 3) Nutrient Management, 4) Land Treatment, 5) Record Keeping, and 6) Other Manure and Wastewater Utilization Options. Livestock and poultry operations defined as permitted CAFOs are required to have a NMP. Previously, when nutrient management plans have been developed, the contribution of feed management to whole farm nutrient management has not been considered. For those that choose to develop a CNMP, there will be a need for an understanding of the Feed Management element of the CNMP and the tools to assess the merits of a feed management plan and the tools to systematically develop a feed management plan.

![Six Elements Of a CNMP](image)

Figure 1. Six core elements of a comprehensive nutrient management plan.

**Implementation Plan**

Figure 2 outlines the primary roles of those involved with the assessment and implementation of NRCS’s Feed Management Practice Standard 592. The primary role of the nutrient management planner is to determine if the conditions (whole farm nutrient imbalance, soil nutrient build-up, land base is not large enough, or seeking to enhance nutrient efficiencies) exist for the feed management practice to apply; and, to assess (with opportunity checklist) if the livestock or poultry farm is a good candidate for development of a
completed feed management plan (FMP). The primary role of the nutritionist is the completion of the feed management plan checklist in preparation and development of the feed management plan.

Figure 2 – Roles of nutrient management planner and consulting nutritionist in implementing Feed Management practice standard 592.

The roles and steps are shown as part of 4-hour training workshops (see figure 3) with five major steps involved in the assessment and development of a feed management plan. The workshops are designed with different emphases for the nutrient management planner versus the nutritionist. Since the nutrient management planner is more involved with the initial steps of the process, their workshop is designed to create a competency in use of the opportunity checklist and an awareness of the latter stages. In a nutritionist workshop, an awareness of the initial steps is created, while they receive detailed training on the use of the feed management plan checklist and development of the feed management plan. A key element of the workshops is that we have used real farm case studies to demonstrate the tools and assist with a clear understanding of the roles and interpersonal dynamics that might be expected.

The initial assessment by the nutrient management planner is done with species-specific (beef, dairy, poultry and swine) assessment tools called opportunity checklists. The checklists are designed to address a limited number of the most likely feed management practices that can reduce the import of feed nutrients to the farm. Examples of factors include: are diets formulated to meet the requirements of the animal, are animals fed in groups, are ingredients or diets analyzed for nutrient content, are diets formulated for protein fractions, are growth promotants and ionophores used, and are enzymes used. Each of these factors are focused on the reduction of nitrogen or phosphorus in manure or a reduction of imported nutrients. Once the farm has been determined to be a candidate for a FMP, then the nutritionist assumes his/her role.
The nutritionist has the responsibility to utilize the feed management plan checklist (tool) to collect information that will be used to complete the feed management plan. Categories of items in the feed management plan checklist are: targeting nutrient requirements, ration balancing, ration management practices, production aids-enhancers, and monitoring tools. The feed management plan template (tool) is designed to outline and document the feed management practices that will assist with minimizing the import of feed nutrients to the farm. In addition, it is designed to create a “live” document for management to use in strategic and tactical planning. Special attention is given to sampling frequency, analysis of specific nutrients, specific recommendations on practices to adopt, how the feed management plan will change the nutrient composition of manure, and specific review dates.

An intermediary step in the implementation of a FMP that will be considered by some livestock and poultry operations is the economic evaluation of the choice to make rations changes or transport manure a farther distance. This tool will be described in a separate paper at this conference (Koelsch et al., 2007).

**Additional Resources**

In addition to the tools and implementation process that has been described, the project team has developed fact sheets, a chapter for the NRCS Agriculture Waste Field Management Handbook, and internet accessible presentations from a nutrient management planner workshop. The recorded presentations can be accessed at [http://www.ucs.iastate.edu/mnet/cnmp/home.html](http://www.ucs.iastate.edu/mnet/cnmp/home.html). Certification for the nutrient management planner is achieved by attending the Feed Management module of the Iowa State CNMP training ([http://www.ucs.iastate.edu/mnet/cnmp/home.html](http://www.ucs.iastate.edu/mnet/cnmp/home.html)) and meeting NRCS technical service provider requirements. Certification for the nutritionist is achieved by attending a 4 hour Feed Management education workshop and passing an American Registry of Professional Animal Scientists (ARPAS) species specific Feed Management certification exam ([http://www.arpas.org/](http://www.arpas.org/)).
Conclusions

Development of Feed Management Plans is a new opportunity for consultants and advisors to the Livestock and Poultry industry. We encourage you to share this opportunity and assist livestock and poultry producers to remain economically viable and environmentally responsible.

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Specific tools, checklists, fact sheets and the Feed Management Plan Template can be found at http://www.puyallup.wsu.edu/dairy/joeharrison/publications.

References