

Feed Management Plan Development

Use Feed Management Plan Checklist to Develop FMP

Step 4

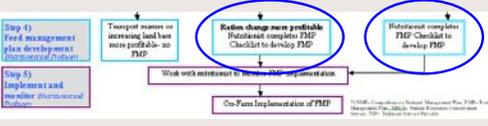


Feed Management



A Key Ingredient in Livestock and Pasture Nutrient Management

Feed Management Plan Development



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    graph TD
      A[Target setting on increasing land has more profitable utilization] --> B[Reason change more profitable? Nutrient complete? FMP Checklist to develop FMP]
      B --> C[Reason change more profitable? FMP Checklist to develop FMP]
      C --> D[Work with nutrient management specialist implementation]
      D --> E[On-Farm Implementation of FMP]
      F[Nutrient complete? FMP Checklist to develop FMP] --> C
      G[On-Farm Implementation of FMP] --> H[On-Farm Implementation of FMP]
  
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Feed Management Plan Checklist



DAIRY
Feed Management Plan Checklist

Feeding management is one of six components of a Comprehensive Nutrient Management Plan (CNMP) as defined by the Natural Resource Conservation Service. Feed management practices may reduce the volume and nutrient content of manure and may be an effective approach to minimizing the impact of nutrients on the farm. Feeding management as part of a CNMP should be viewed as a "consideration" but not a "requirement" as some practices will not be economical on some dairies. The following checklist is designed to assist dairy producers and their nutrient management advisor to determine feeding management factors that affect nutrient management. The checklist is meant to be used as an on-farm assessment tool. The factors contained in this assessment can be used as a guide to document or identify feeding management practices that will contribute to achieving nutrient balance at a whole farm level. Nitrogen and phosphorus are the two nutrients that are required to be managed as part of a CNMP. When nitrogen and phosphorus

Feed Management Plan Checklist

Feed Management Plan Checklist							
Feed Management Considerations	Is it already implemented?	Was it considered?	Will it be economical?	Will it be implemented?	Will it be considered in the future?	Benefit to environment	
	Yes	No	Yes	No	Yes	No	Yes No
Targeting Nutrient Requirements							
Formulate multiple rations to meet nutrient requirements of cattle (high producing, low producing, lactating, dry, multiple herds groups)							N, NH3, P
Analyze CP							

Feed Management Plan Checklist

	Yes	No	Yes	No	Yes	No	Yes	No
Targeting Nutrient Requirements								
Formulate multiple rations to meet nutrient requirements of cattle (high producing, low producing, lactating, dry, multiple herds groups)	✓							N, NH3, P
Analyze CP								
Analyze RDP								N, NH3
Analyze P and K								P
Determine dry matter intake	✓							N, NH3, P

Feed Management Plan Checklist

	Yes	No	Yes	No	Yes	No	Yes	No
Ration Balancing								
Formulate rations rationally for the following:								
a) Forage quality (NDF, ADF, CP, F, starch, DM)	✓							N, NH3, P
b) Changes in ration feedstuffs	✓							N, NH3, P
c) Dry matter content of ingredients	✓							N, NH3, P
d) Formulate for positive or negative DCAD cations (Na, K, Cl, and S)	✓							K
e) Balance rations using either ruminant degradable protein or amino acid content	partly ✓		✓		✓		✓	N, NH3

Use of RUP-RDP-AA in Diets

WSU Study

- Two diets consisted of the general herd Diet and a reduced CP diet utilizing Alimet, lysine HCL, and SoyPass
- Diets balanced with CPM



Effect of Reduced CP Diets with Amino Acid Formulation In a High Producing Herd

Item	Control	Reduced CP Diet
Diet CP, %	17.8	16.9
DMI, lbs	56.7	55.2
Milk, lbs/day	99.9	101.9
Milk Protein, %	2.90	2.93
Milk Protein, lbs	2.88	2.95
Ratio of Milk True Protein: Feed Protein	.285	.316



Effect of Reduced CP Diets with Amino Acid Formulation In a High Producing Herd

Item	Control	Reduced CP Diet	% Change
Nitrogen Intake, gms	734	680	- 7.4
Milk Total Nitrogen, gms	240	246	+ 2.5
Predicted Urinary Nitrogen, gms	289	239	- 17.3
Calculated Fecal Nitrogen, gms	205	195	- 5.0



Economic Evaluation

Item	Control	Experimental
Feed Cost, \$/day	4.82	4.88
Milk Income, \$/day	11.92	12.10
IOFC, \$/day/cow	7.10	\$ 7.22



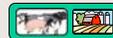
Feed Management Plan Checklist

	Yes	No	Yes	No	Yes	No
Producers Management Practices						
All components listed in feeding protocol	✓					
Protein supplements fed/added in feeding ration	✓				N, NHP, P	
Non-protein N supplements	✓				N, NHP, P	
Protein supplements	✓				N, NHP, P	
Protein supplements added to feed	✓				N, NHP, P	
Protein supplements added to feed for most	✓				N, NHP, P	
Protein supplements brought in from outside	✓					



Feed Management Plan Checklist

	Yes	No	Yes	No	Yes	No
Producers Management Practices						
All components listed in feeding protocol	✓					
Protein supplements fed/added in feeding ration	✓					
Non-protein N supplements	✓				N, NHP	
Protein supplements	✓				N, NHP	
Protein supplements added to feed	✓					
Protein supplements added to feed for most	✓					
Protein supplements brought in from outside	✓		??	??		



Fact Sheets for Additional Details



INTERPRETING MUN VALUES

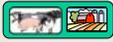
Mike Hutzler
Extension Dairy Specialist
University of Illinois, Urbana

Disclaimer:
This fact sheet reflects the best available information on the topic as of the publication date.
Date: 6-20-2006

This Feed Management Education Project was funded by the USDA NRCES CS2 program.
Additional information:

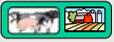
Introduction:
Milk processing units and DHI provide dairy managers with milk urea nitrogen (MUN) values on bulk milk and individual milk samples. MUN is a useful tool that can allow dairy managers to monitor feeding and environmental changes in their herds. The following points can allow you to interpret your MUN test results.

Source of MUN

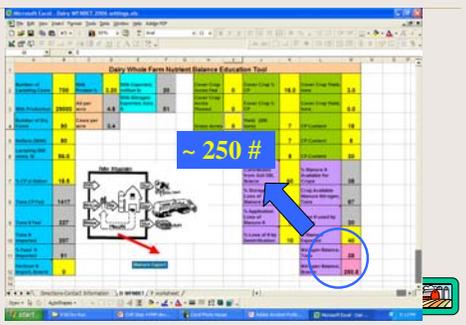


Feed Management Plan Checklist

	Yes	No	Yes	No	Yes	No	Yes	No
Forage Management Practices	✓		✓		?		?	
Maximize the amount of home-grown OR locally-sourced feeds in ration			consider G.S.					
Maximize quality of home-grown								



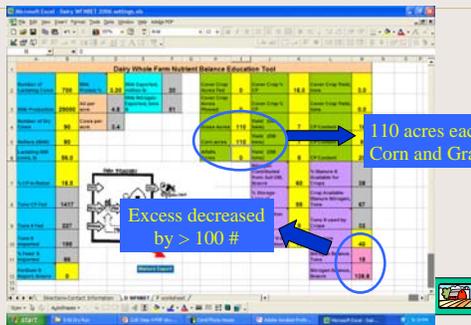
Use of Whole Farm Nutrient Management Tool To Evaluate Management Options



~ 250 #



Use of Whole Farm Nutrient Management Tool To Evaluate Management Options



110 acres each of Corn and Grass

Excess decreased by > 100 #



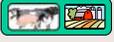
Feed Management Plan Checklist

1) Harvest crop when nutrients reach or exceed (grass/legume) or (corn) are high and allow to cure	✓							
2) Pick upage quickly, cover quickly, and use a ground storage additive	✓							
3) Store different quality forages separately to match nutrient level of forages to nutrient requirements of animal	✓		Hay Only					
4) Mechanically process corn silage	✓							
5) Analyze all silages for digestibility, protein, fiber digestibility, and available	✓							



Feed Management Plan Development

Specific Farm Information

Feed Management Plan Template

Date: Feed Management Plan Template (Draft) 2-21-06

20

Producer's Name: **A & J Trudy**
 Address: **18121 Loop Drive**
 Address:
 Town, State, Zip: **Estacada, WA, 98121**

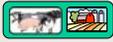
Farm Name: **A & J Trudy Dairy**
 Phone: **360-895-9081**
 Fax:
 Email:

Contractor's Name: **D. B. Bula, PhD, P.D. and J. Heston**
 Address: **200 Estacada, WA, 98121**
 Address:
 Town, State, Zip:

Business Name: **Nutrition for Profit and Sustainability**
 Cell Phone: **800-786-1234**
 Fax:
 Email:

Planner's Name: **John, Tom, Brian, and Mike**
 Address:
 Address: **18121 Loop Drive**
 Town, State, Zip: **Estacada, WA, 98121**

Business Name: **Nutrient Management Advantages Inc**
 Phone:



Feed Management Plan Template

Date: Feed Management Plan Template (Draft) 2-21-06

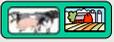
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Specific Purpose

- Supply the quantity of available nutrients required by livestock and poultry for maintenance, production, performance, and reproduction, while reducing the quantity of nutrients, especially nitrogen and phosphorus, excreted in manure by minimizing the over-feeding of these and other nutrients.
- Improve net farm income by feeding nutrients more efficiently.

Date Plan Written: **June 21, 2006**

The Plan will be reviewed at (what interval, i.e. yearly) and by whom: **Yearly in June**



Feed Management Plan Development

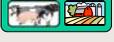
Specific Animal and Facility Information





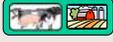
Farm Specific Information

Dairy Cattle: Animal Information	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
Define Groups (i.e. production level, dry, heifers)	1000-2000 lb						
Average Number of animals in groups	40	20	20	40	20	20	20
Average Milk Production	50	20	20	20	20	20	20
Average Lactating Period %	85	80	80	80	80	80	80
Facility Housing Animals: name, description							
Portion of Manure collected %	100	100	100	100	100	100	100
Manure Total Solids (%)*	8	8	8	8	8	8	8
Manure Solid or Liquid?	L	L	L	L	L	L	L
Manure Information							
Particulate							
Indicate how the following information will be measured: * Wet or Dry basis?							
Feed intake	40	20	20	20	20	20	20
Am	8	8	8	8	8	8	8
Dairy C/P	10	10	10	10	10	10	10
Dairy P	10	10	10	10	10	10	10
Dairy K	10	10	10	10	10	10	10



Type(s) of Manure Handling

Specific Farm Information

Type(s) of Manure Handling

Portion of Manure collected %	100	100
Manure Total Solids (%)*	9	9
Manure: Solid or Liquid?	L	L
Poultry manure on shavings or sawdust held in housing - Composted		
1-Cell anaerobic treatment lagoon		XXXXXX
Multi-cell anaerobic treatment lagoon		
Is runoff Collected? Yes/No		
Application Method		
Travelling Gun - Delivery Hose - 400 gpm, 300' width		
Injection		XXXXXX
Immediate Incorporation		

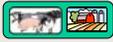


Summary of Feeding Practices

Specific Farm Information



Include narrative
Or
FMP Assessment
Checklist



Summary of Feeding Practices

Summary of Feeding Practices and Equipment/Technologies utilized on the farm

Narrative of these practices will have been adopted and/or insert the completed Farm Plan Assessment Checklist. See checklist for practices that have been adopted.

Include how diet formulation was adjusted to what standards (i.e., NRC or proprietary recommendations, etc).

Diets are formulated according to NRC Nutrient requirements of Dairy Cattle, 2001 and adjusted based on field experience with high producing herds (30,000#).

Lactating - There are seven groups of lactating cows. The lactating cows are grouped as follows: Fresh pens - fresh cows less than 21 days in milk and at 80% peak capacity; Pen 1 & 2 - cows less than 21 days in milk; Pen 3 - cows 21 to 42 days in milk; Pen 4 - cows 43 to 63 days in milk; Pen 5 - cows 64 to 84 days in milk; Pen 6 - cows 85 to 105 days in milk; Pen 7 - cows 106 to 126 days in milk. All lactating cows are fed the same TMR and based on current farm resources per acre and a protein of 4 times per day. Cows are fed for minimal feed refusal, 5% refusal rate. Feed bunks are cleaned daily. Feed is loaded into the mixer wagon equipped with load cells in the sequence based on manufacturer recommendations and modified based on quality of alfalfa hay. Commodity feeds are stored in 30 ton commodity bins and mixed twice per week into a complete mixed grain for daily use in the TMR mix. On a daily basis, alfalfa hay, corn silage, complete mixed grain, molasses, and water are mixed to form the TMR. Individual feeds currently used consist of processed corn silage, alfalfa hay, wheat straw, whole cotton seed, steam rolled corn, beet pulp, canola meal, soybean meal, porcine blood meal, dried distillers grains, molasses, and vitamin-mineral pre-mix. In addition, yeast and ruminant are fed, and rBST is administered.

Insert FMP checklist

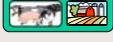


Diet Formulation



NRC guidelines
Or other sources

Diets are formulated according to NRC Nutrient requirements of Dairy Cattle, 2001 and adjusted based on field experience with high producing herds (30,000#).

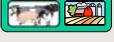


Laboratory Analyses



CP, NDF,
Minerals,
etc

Analyze water



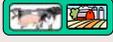
Sampling and Analysis

Indicate when lab analyses were conducted on feeds and by what lab.

Lab analyses are conducted on commodity feeds every 6 months by Custom Dairy Services in Lynden, WA. Commodities are analyzed for moisture, protein, ADF, NDF and macro minerals.

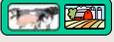
Alfalfa is purchased based on test and analyzed on a monthly basis.

Corn silage is analyzed for DM every few days upon opening a new pit and then approximately every 4 months. Corn silage is analyzed more frequently at the beginning of the bunk. As analyses become consistent, the frequency is reduced to approximately every 4 to 6 months. Both alfalfa and corn silage are analyzed for moisture, protein, NDF, macro minerals along with sulfur and chlorine.



Nutrients in Manure

Nutrients in manure will be estimated during the plan development



Summary of Feeding Practices

Summary of Feeding Practices and Equipment/Technologies utilized on the farm
 Narrative of those practices that have been adopted and/or insert the completed Farm Plan Assessment Checklist.

Include how diet formulation was achieved, to what standards (i.e., NRC or proprietary recommendations, etc).

Indicate when lab analyses were conducted on feeds and by what lab.

Indicate if nutrient analysis of drinking water was included in diet formulation.

Note the expected volume of manure excreted on manure storage requirements.

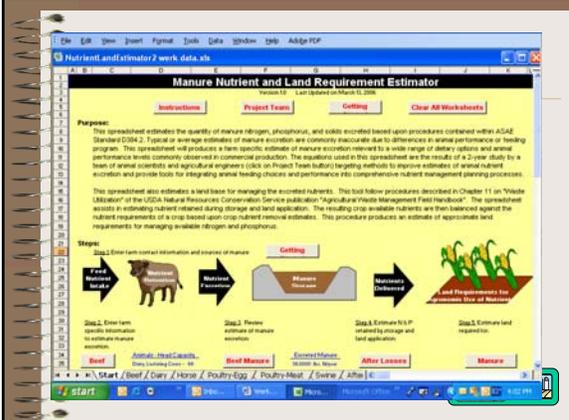
Note the potential of any feed byproducts fed and their impact on nutrients in manure.

Note the impact of feed management practices, animal management practices, and diet manipulations on manure odors, pathogens, animal health and well-being.

Note use of manure on farm for production of forages and crops.

Make note of use of manure analysis (as excreted or stored) to estimate the impact of feeding strategies.



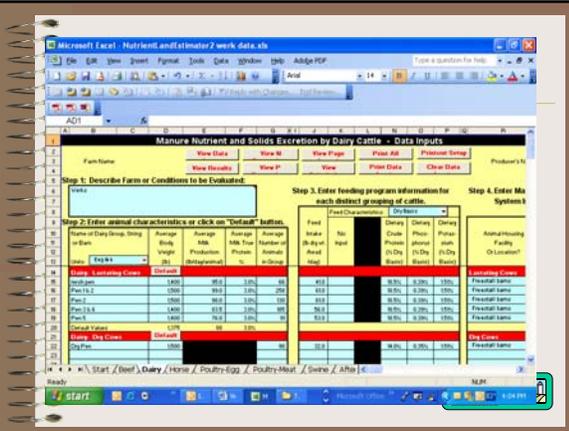


Manure Nutrient and Land Requirement Estimator

Purpose: This spreadsheet estimates the quantity of manure nitrogen, phosphorus, and solids excreted based upon procedures contained within ASAE Standard CS14.2. Typical or average estimates of manure excretion are commonly encountered due to differences in animal performance or feeding program. This spreadsheet will produce a farm specific estimate of manure excretion relevant to a wide range of dairy systems and animal performance levels commonly observed in commercial production. The equations used in this spreadsheet are the results of a 2-year study by a team of animal scientists and agricultural engineers (click on Project Team button) targeting methods to improve estimates of animal nutrient excretion and provide tools for integrating animal feeding choices and performance into comprehensive nutrient management planning processes.

Steps:

- Step 1: Enter farm context information and sources of manure.
- Step 2: Enter farm specific production information to estimate manure excretion.
- Step 3: Review and/or adjust manure excretion estimates.
- Step 4: Estimate N, P, and Solids excretion (based on storage and land application).
- Step 5: Estimate land requirements for manure.

Manure Nutrient and Solids Excretion by Dairy Cattle - Data Inputs

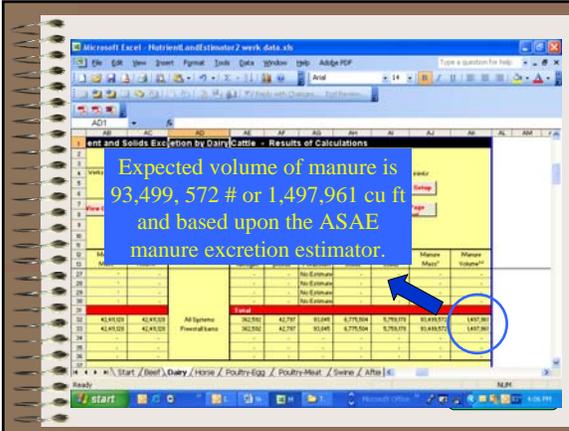
Step 1: Describe Farm or Conditions to be Evaluated.

Step 2: Enter animal class characteristics (click on "Default" button).

Step 3: Enter feeding program information for each distinct grouping of cattle.

Step 4: Enter Manure Systems.

Animal Class	Number	Average Body Weight (kg)	Average Milk Production (kg)	Average Milk Protein (%)	Average Milk Fat (%)	Manure Excretion (kg)
Dairy Cows	100	600	1000	3.5	4.5	10000
Dairy Heifers	50	400	500	3.5	4.5	5000
Dairy Calves	20	200	100	3.5	4.5	2000



Manure Nutrient and Solids Excretion by Dairy Cattle - Results of Calculations

Expected volume of manure is 93,499,572 # or 1,497,961 cu ft and based upon the ASAE manure excretion estimator.

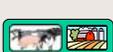
Category	Manure (kg)	N (kg)	P (kg)	Solids (kg)
Total	93,499,572	1,497,961	1,497,961	1,497,961

Feed Management Plan Development

Specific Farm Information



Make note of any ingredients such as water, molasses, and byproduct feeds.



Byproduct Feeds

Table 2. Phosphorus content of selected feeds

Feed	% P (DM basis)	Feed	% P (DM basis)
Legume hay	0.26	Distiller's grain	0.83
Cool-season grass	0.23	Brewer's grain	0.67
Cereal silage	0.31	Almond hulls	0.13
Corn silage	0.26	Whole cottonseed	0.60
Corn grain	0.30	Wheat bran	1.18
Barley grain	0.39	Wheat midds	1.02
Oats	0.40	Soy hulls	0.17
Soybean meal	0.70	Canola meal	1.10



Feed as Major Source of P

Table 1. Total phosphorus (lbs), feed P, % feed P imported on livestock operations, Washington Co., Oregon 1992

	Total P, lbs	Feed P, lbs	% feed P
Dairy 1	3,383	2,400	71
Dairy 2	13,321	6,500	49
Dairy 3	10,354	5,700	55
Cow-calf beef	1,040	1,000	96

Manure Odors, Pathogens, Animal Health and Well-Being

Note where appropriate the impact of feed management practices, animal management practices, and diet manipulation on:

- Manure Odors
- Pathogens
- Animal Health and Well-Being

Note use of manure on farm for production of forages and crops

Note use of manure on farm for production of forages and crops.
 Manure solids and manure laden sand is exported off-farm. All liquid manure is used for production of corn silage.

Effect of Ration on Manure Composition

Record of the initial estimate of the impact of adopted feed strategies on manure content.
 Record of any manure analysis that was done after the feeding strategy was implemented.

Use Manure Excretion Estimator Tool



- ### Recommendations
- Recommendations:
- This section should summarize the feed management practices that need to be implemented.
- It is recommended if economics are favorable that the following practices be implemented.
 - Reduce diet CP by 1 % unit with addition of quality RUP sources and amino acid supplements.
 - Increase particle size of processed corn silage.
 - Consider growing grass silage to replace some import of feed nitrogen

Next Step # 5 - Implementation on Farm

Describe the activities and records needed to keep the Feed Management Plan a live and active management tool.