Appendix A

Nutrient Flow Worksheets

The following pages contain examples of worksheets that can be used to document the flow of nutrients onto and away from the farm. Estimating mass nutrient balance is important in developing a comprehensive nutrient management plan. The information will also be helpful when making management decisions. Decisions that result in better utilization of farm nutrients can help improve farm profitability by reducing fertilizer purchases.

The following worksheets are a guide for documenting the flow of nutrients onto and out of the farm and may need to be modified for your operation.

Step 1 -- Determine the amount of nutrients brought onto the farm.

A. Feed Purchases: Concentrates, mineral mixes, grains, etc.

Item	Estimated Tons/Yr	%DM	%CP	%P	%K
1.					
2.					

B. Forage and Bedding Purchases: Silage, hay, straw, shavings, sawdust

Item	Estimated Tons/Yr	%DM	%CP	%P	%K
3.					
4.					

C. Fertilizer Purchases: Dry, liquid, anhydrous, etc.

Item	Estimated Tons/Yr	Analysis (%) N	P_2O_5	K_2O
5.				
6.				

D. Nitrogen Fixation: Legume haycrop acreage

Acreage	Estimated Yield (Tons DM)	%CP
7. ≥90% Legume		
8. Gr/leg mix (≥25% legume)		

Step 2 -- Determine nutrient removed (sold) from the farm.

A. Animal Products Sold: Milk, culls, young stock, etc.

Item	Amount Sold
9. Milk	pounds/yr
10. Cull Adult Animals	number/yr
11. Sold Young Stock	number/yr

B. Crop Products Sold: Hay, silage, straw, grains, etc.

Crop	Amount Sold
12.	tons/yr
13.	tons/yr

C. Miscellaneous Products Sold: Manure, compost, etc.

Item	Amount Sold
14.	tons/yr
15.	tons/yr

Calculating Mass Balance for Nitrogen

I. Nitrogen brought onto the farm (lbs.):

A. FEED	LBS	X	%DM	X	%CP*	÷	6.25	=	LBS FEED N
TOTAL LBS FEED NITROGEN PURCHASED = **A**									
B. FORAGES AND BEDDING	LBS	X	%DM	X	%CP*	÷	6.25	=	LBS FORAGE N
TOTAL LBS FORAGE AND BEDDING NITROGEN PURCHASED = **B**									

C. FERTILIZERS	LBS	X	% N ANALYSIS	=	LBS FERTILIZER N
TOTAL LBS FERTILIZER NITROGEN PURCHASED = **C**					

Total lbs Nitrogen brought onto the farm (A + B + C) = _____ lbs N

II. Nitrogen removed from the farm (lbs):

A. ANIMAL	NUMBER OR LBS	X	AVE WT	X	%N			=	LBS ANIMAL N
Milk			----		.0056				
Adults					.0253				
Youngstock					.0288				
TOTAL LBS ANIMAL NITROGEN REMOVED = **A**									
B. CROPS	LBS SOLD	X	%DM	X	%CP*	÷	6.25	=	LBS CROP N
TOTAL LBS CROP NITROGEN REMOVED = **B**									
C. MISC PRODUCT	LBS SOLD	X	%DM	X	%CP*	÷	6.25	=	LBS MISC N
TOTAL LBS MISCELLANEOUS NITROGEN REMOVED = **C.**									

Total lbs Nitrogen removed from the farm (A + B + C) = _____lbs N

III. Nutrients remaining on the farm (Lbs.):

Total Lbs brought on the farm - Total Lbs N removed from the farm = _____lbs. N

Potential fate of remaining nitrogen: Fertilizer for crop production, ammonia volatilization, leaching, runoff.

*__Note:__ Protein is about 16% N; thus, the conversion factor of %CP divided by 6.25 to determine the amount of N. If a nitrogen analysis exists, multiply the %N by the lbs DM to determine lbs of N.

Calculating Mass Balance for Phosphorus

I. Phosphorus brought onto the farm (Lbs):

A. FEED	LBS	X	%DM	X	%P	=	LBS FEED P
TOTAL LBS FEED PHOSPHORUS PURCHASED = **A**							
B. FORAGES AND BEDDING	LBS	X	%DM	X	%P	=	LBS FORAGE P
TOTAL LBS FORAGE AND BEDDING PHOSPHORUS PURCHASED = **B**							
C. FERTILIZERS	LBS	X	$\%P_2O_5$ ANAL	X	.43*	=	LBS FERTILIZER P
TOTAL LBS FERTILIZER PHOSPHORUS PURCHASED = **C**							

Total lbs Phosphorus brought onto the farm (A + B + C) = _____lbs P

II. Phosphorus removed from the farm (Lbs):

A. ANIMAL	NO OR LBS	X	AVE WT	X	%P	=	LBS ANIMAL P
Milk					.0010		
Adults					.0072		
Youngstock					.0083		
TOTAL LBS ANIMAL PHOSPHORUS REMOVED = **A**							
B. CROPS SOLD	LBS SOLD	X	%DM	X	%P	=	LBS CROP P
TOTAL LBS CROP PHOSPHOROUS REMOVED = **B**							
C. MISC PRODUCTS	LBS SOLD	X	%DM	X	%P	=	LBS MISC P
TOTAL LBS MISCELLANEOUS PHOSPHOROUS REMOVED = **C**							

Total lbs Phosphorus removed from the farm (A + B + C) = _____lbs P

III. Phosphorus remaining on the farm (lbs):

Total lbs P brought onto the farm - Total lbs P removed from the farm = _____lbs P

Potential fate of remaining Phosphorus: Fertilizer for crop production, accumulation in soil, and runoff.

***Reflects % elemental Phosphorus in P_2O_5.**

Calculating Mass Balance for Potassium

I. Potassium brought onto the farm (Lbs):

A. FEED	LBS	X	%DM	X	%K	=	LBS FEED K

TOTAL LBS FEED POTASSIUM PURCHASED = **A**							
B. FORAGES AND BEDDING	LBS	X	%DM	X	%K	=	LBS FORAGE K
TOTAL LBS FORAGE AND BEDDING POTASSIUM PURCHASED = **B**							
C. FERTILIZERS	LBS	X	$\%K_2O$ ANAL	X	.83*	=	LBS FERTILIZER K
TOTAL LBS FERTILIZER POTASSIUM PURCHASED = **C**							

Total lbs Potassium brought onto the farm (A + B + C) = _____lbs K

II. Potassium removed from the farm (lbs):

A. ANIMAL	NUMBER OR LBS	X	AVE WT	X	%K	=	LBS ANIMAL K
Milk							
Adults							
Youngstock							
TOTAL LBS ANIMAL POTASSIUM (K) REMOVED = **A**							
B. CROPS	LBS SOLD	X	%DM	X	%K	=	LBS CROP K
TOTAL LBS CROP POTASSIUM (K) REMOVED = **B**							
C. MISC PRODUCTS							LBS MISC K
TOTAL LBS MISCELLANEOUS POTASSIUM REMOVED = **C**							

Total lbs Potassium removed from the farm (A + B + C) = _____lbs K

III. Potassium remaining on the farm (Lbs):

Total lbs K brought onto the farm - Total lbs K removed from the farm = _____lbs K

Potential fate of remaining Potassium: Fertilizer for crop production, accumulation in soil, and runoff.

***Reflects % elemental Potassium in K_20.**