Impact of Importing Feed on the Farm Nutrient Balance

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Nutrient Balance Concept

Inputs

Outputs

Your Farm

Nutrient Balance Concept

Inputs **Outputs**

Your Farm

Nutrient Balance Concept

Outputs

Inputs

Your Farm

BALANCE +

Nutrient Accumulation

Nutrient Balance Concept

Inputs ***Outputs***

Your Farm

BALANCE -

Nutrient Depletion

Farm Nutrient Balance

Inputs → **What are Inputs and Outputs on Your Farm for N, P and K?** → **Outputs**

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Farm Nutrient Balance

Inputs

Managed

- Purchased feed*
  - Concentrates
  - Bought hay
  - Silage
- Fertilizer
  - N fixation by legumes
  - Purchased fertilizer
- Bought calves and cows

Outputs

Managed

- Milk*
- Sold calves and cows

Un-Managed

- N loss from manure*

Farm Nutrient Balance

What is the Impact?

Imported Hay

Concentrate Fed in the Barn

Example Grazing Dairy -36

- 1 cow/acre
- Milk Production ~12,000 lbs/cow/yr
- Feed Profile
  - % Imported DM – 36%
  - Concentrate - 1.5 T/cow/yr
  - Bought Alfalfa - 0.84 T/cow/yr

Nutrient Balance Concept

Inputs **Outputs**

lb/cow **lb/cow**

	BALANCE: GD36	
N = 120	N = - 123	N = 243
P = 17	P = + 5	P = 12
K = 68	K = + 50	K = 18

Units: lb/cow

Nutrient Balance Concept

Inputs

- Concentrate (1.5 T/cow/yr)
  - **N = 64.4 lb/cow**
  - **P = 11.8 lb/cow**
  - **K = 25.8 lb/cow**
- Alfalfa (0.8 T/cow/yr)
  - **N = 56.1 lb/cow**
  - **P = 5.1 lb/cow**
  - **K = 42.3 lb/cow**

Outputs

Managed

- Milk (12,000 lb)
  - **N = 62.2 lb/cow**
  - **P = 12.1 lb/cow**
  - **K = 18.2 lb/cow**

Un-Managed

- N loss from manure
  - **N = 181 lb/cow**

Example Grazing Dairy -51

- 0.75 cow/acre
- Milk Production ~12,000 lbs/cow/yr
- Feed Profile
  - % Imported DM – 51%
  - Concentrate - 1.5 T/cow/yr
  - Bought Alfalfa – 1.2 T/cow/yr
  - Bought Hay – 0.6 T/cow/yr

Example Grazing Dairy -0

- 1.4 cow/acre
- Milk Production ~9,000 lbs/cow/yr
- Feed Profile
  - % Imported DM – 0%
  - Concentrate - 0 T/cow/yr
  - Bought Alfalfa – 0 T/cow/yr
  - Bought Hay = 0 T/cow/yr

Impact of Imported Feed on Farm Nutrient Balance

GD0 BALANCE	GD36 BALANCE	GD51 BALANCE
N = - 227	N = - 123	N = - 75
P = - 9	P = + 5	P = + 10
K = - 14	K = + 50	K = + 90

Units: lb/cow

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Impact of Imported Feed on Farm Nutrient Balance

GD0 BALANCE	GD36 BALANCE	GD51 BALANCE
N = - 227	N = - 123	N = - 75
P = - 9	P = + 5	P = + 10
K = - 14	K = + 50	K = + 90
Feed Fertilizer Value 0	Feed Fertilizer Value ~$85	Feed Fertilizer Value ~$130

Units: lb/cow, $/cow

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Conclusions:

- **Imported feed = fertilizer for your farm.**
- **Farms with imported feed are typically phosphorus and potassium neutral or surplus… on average.**

Nutrient Balance: Within the Farm

Where do the nutrients go?

Where do the nutrients go?

Milk Tank

Manure Storage

Laneways

Paddocks

Where does the phosphorus go?

Purchased Concentrate: 12

Purchased Alfalfa: 5

Grazed Forage: 19

Fed Forage: 8

Dairy Cow

Milk: 12

Export: 27

Excreted

While Grazing: 15

While Eating Hay: 13

To Storage: 2

To Laneways: 2

Paddocks

+3

Returned: 30

GD36 - Units: lb P/cow/yr

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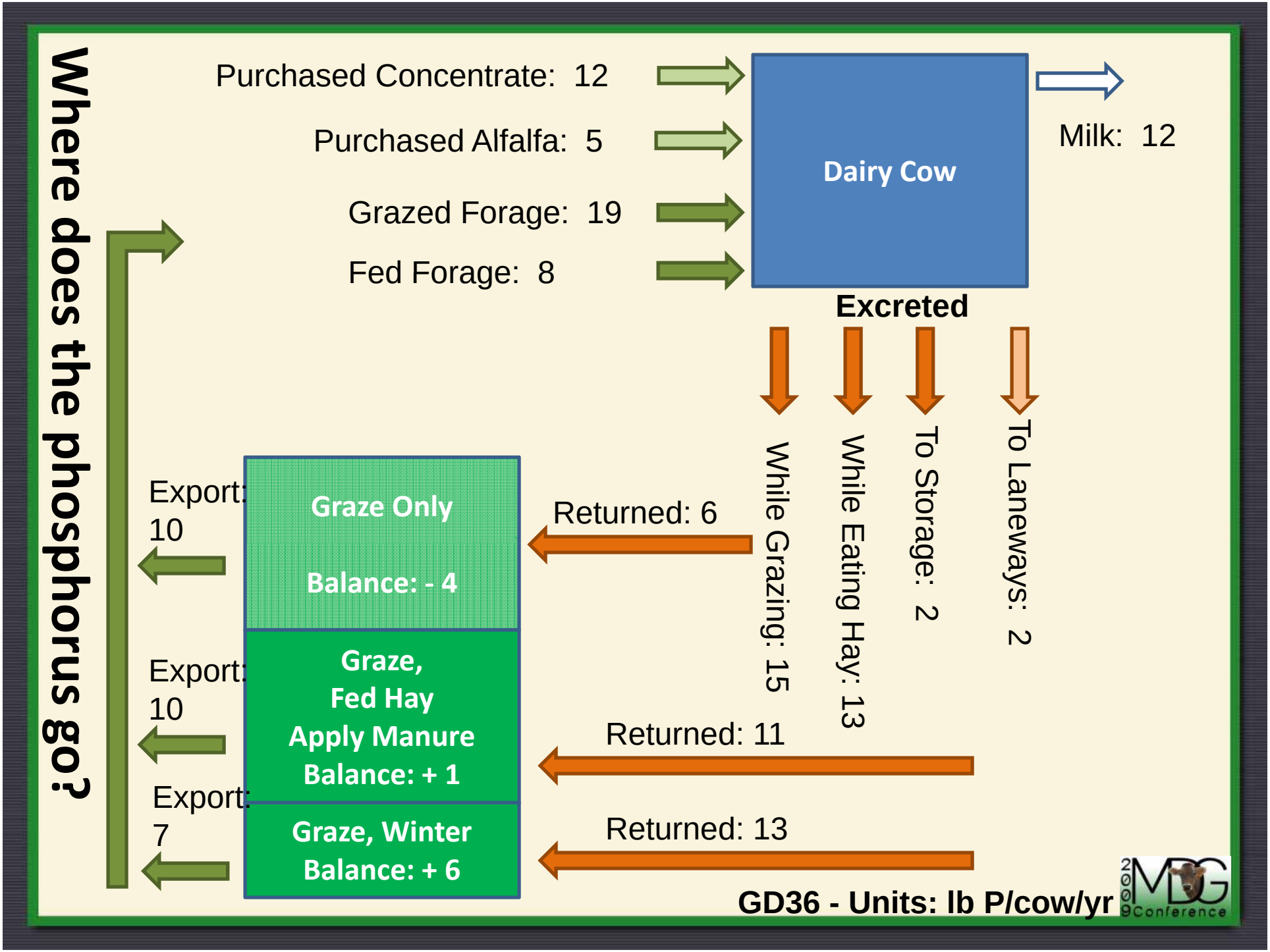
Where does the phosphorus go?
Purchased Concentrate: 12
Purchased Alfalfa: 5
Grazed Forage: 19
Fed Forage: 8
Dairy Cow
Milk: 12
Excreted
While Grazing: 15
While Eating Hay: 13
To Storage: 2
To Laneways: 2
Returned: 6
Graze Only
Balance: - 4
Export: 10
Graze, Fed Hay Apply Manure
Balance: + 1
Export: 10
Returned: 11
Graze, Winter
Balance: + 6
Export: 7
Returned: 13
GD36 - Units: lb P/cow/yr
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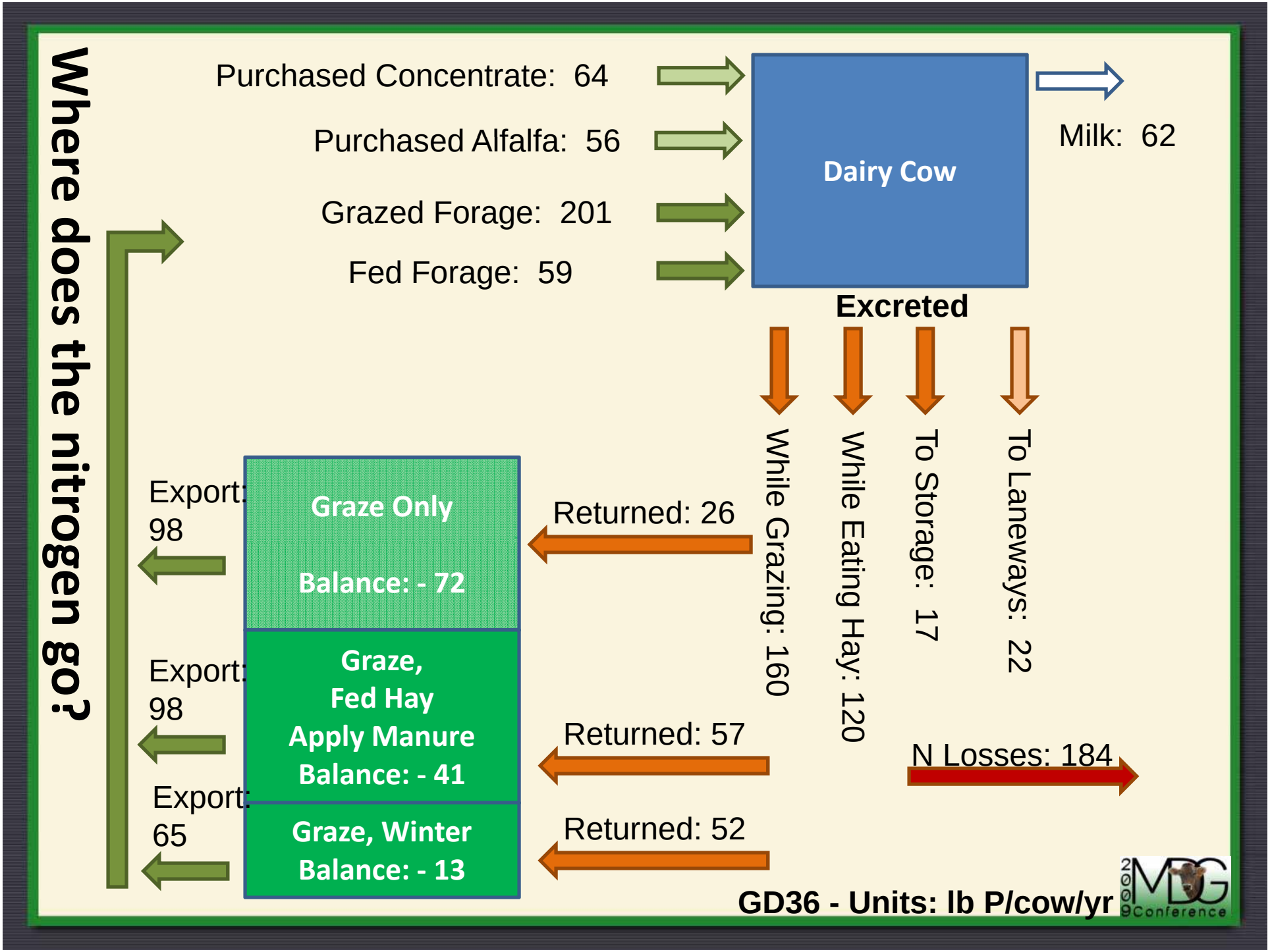
Where does the nitrogen go?
Purchased Concentrate: 64
Purchased Alfalfa: 56
Grazed Forage: 201
Fed Forage: 59
Dairy Cow
Milk: 62
Excreted
While Grazing: 160
While Eating Hay: 120
To Storage: 17
To Laneways: 22
Graze Only
Balance: - 72
Graze, Fed Hay Apply Manure
Balance: - 41
Graze, Winter
Balance: - 13
Returned: 26
Returned: 57
Returned: 52
Export: 98
Export: 98
Export: 65
N Losses: 184
GD36 - Units: lb P/cow/yr
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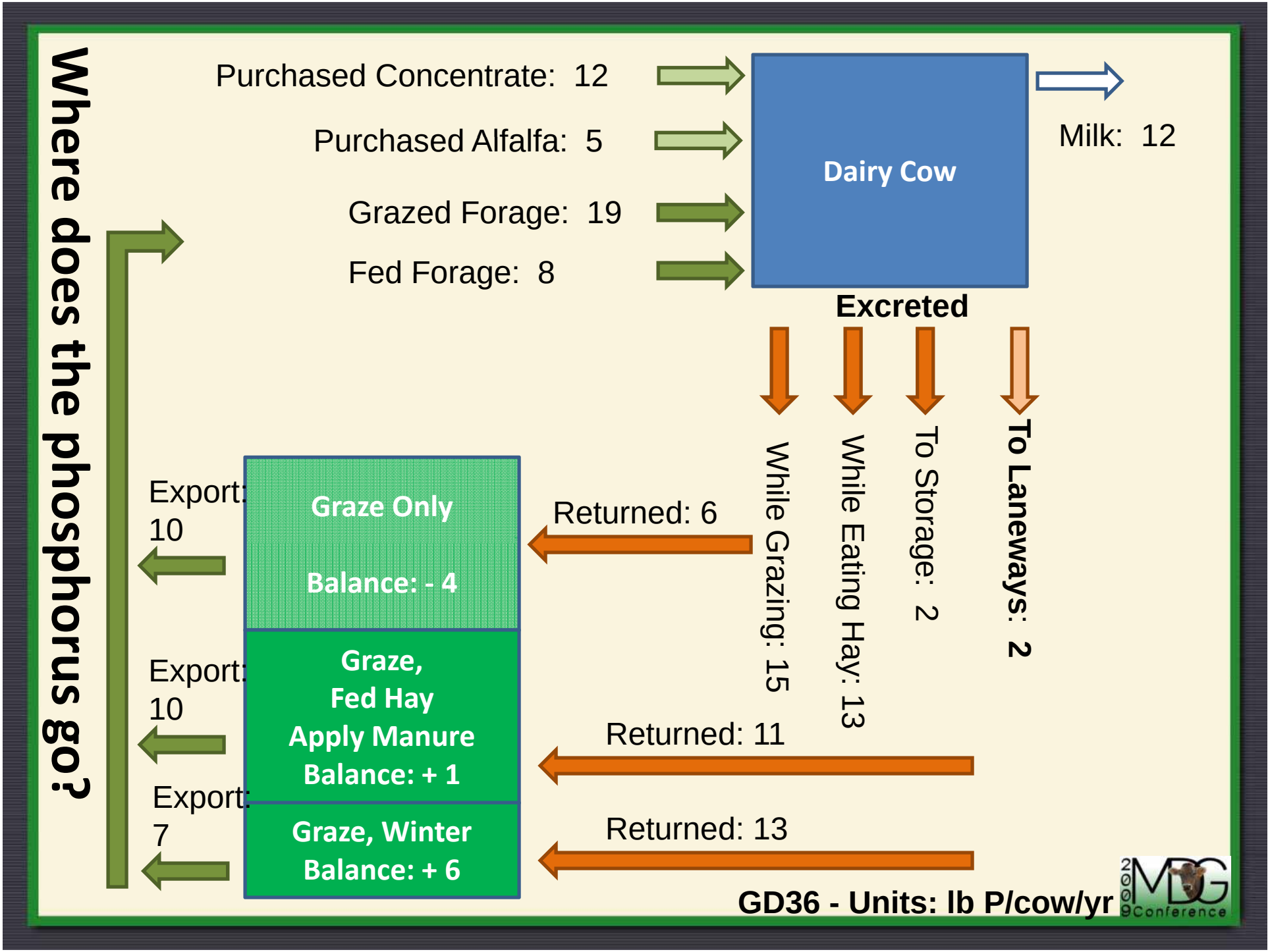
Where does the phosphorus go?
Purchased Concentrate: 12
Purchased Alfalfa: 5
Grazed Forage: 19
Fed Forage: 8
Dairy Cow
Milk: 12
Excreted
While Grazing: 15
While Eating Hay: 13
To Storage: 2
To Laneways: 2
Returned: 6
Returned: 11
Returned: 13
Graze Only
Balance: - 4
Graze,
Fed Hay
Apply Manure
Balance: + 1
Graze, Winter
Balance: + 6
Export: 10
Export: 10
Export: 7
GD36 - Units: lb P/cow/yr
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Loading the Laneways:

100 cows	0.5 miles laneway	164 lbs P/A
100 cows	1.0 mile laneway	82 lbs P/A

- Assume 20-ft wide laneway

Conclusions:

- **Imported feed = fertilizer for your farm.**
- **Your farm is a patchwork of nutrient surplus and nutrient deficit paddocks.**
- **Nutrient balance calculations help you understand where fertilizer is needed on your farm.**

Supplemental Information

Example Grazing Dairy -51

- 0.75 cow/acre
- Milk Production ~12,000 lbs/cow/yr
- Feed Profile
  - % Imported DM – 51%
  - Concentrate - 1.5 T/cow/yr
  - Bought Alfalfa – 1.2 T/cow/yr
  - Bought Hay – 0.6 T/cow/yr

Nutrient Balance Concept

Inputs **Outputs**

lb/cow

N = 164
P = 22
K = 108

BALANCE: GD51

N = - 75
P = + 10
K = + 90

lb/cow

N = 239
P = 12
K = 18

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Nutrient Balance Concept

Inputs

- Concentrate (1.5 T/cow/yr)
  - **N = 64.4 lb/cow**
  - **P = 11.8 lb/cow**
  - **K = 25.8 lb/cow**
- Alfalfa (1.2 T/cow/yr)
  - **N = 77.0 lb/cow**
  - **P = 6.6 lb/cow**
  - **K = 57.9 lb/cow**
- Bought Hay (0.6 T/cow/A)
  - **N = 23.0 lb/cow**
  - **P = 2.9 lb/cow**
  - **K = 24.2 lb/cow**

Outputs

<u>Managed</u>

- Milk
  - **N = 62.2 lb/cow**
  - **P = 12.1 lb/cow**
  - **K = 18.2 lb/cow**

<u>Un-Managed</u>

- N loss from manure*
  - **N = 177 lb/cow**

Example Grazing Dairy -0

- 1.4 cow/acre
- Milk Production ~9,000 lbs/cow/yr
- Feed Profile
  - % Imported DM – 0%
  - Concentrate - 0 T/cow/yr
  - Bought Alfalfa – 0 T/cow/yr
  - Bought Hay – 0 T/cow/yr

Nutrient Balance Concept

Inputs **Outputs**

lb/cow

N = 0

P = 0

K = 0

BALANCE: GD0

N = - 227

P = - 9

K = - 14

lb/cow

N = 227

P = 9

K = 14

Nutrient Balance Concept

Inputs

- Concentrate (1.5 T/cow/yr)
  - **N = 0 lb/cow**
  - **P = 0 lb/cow**
  - **K = 0 lb/cow**
- Alfalfa (1.2 T/cow/yr)
  - **N = 0 lb/cow**
  - **P = 0 lb/cow**
  - **K = 0 lb/cow**
- Bought Hay (0.6 T/cow/A)
  - **N = 0 lb/cow**
  - **P = 0 lb/cow**
  - **K = 0 lb/cow**

Outputs

<u>Managed</u>

- Milk
  - **N = 46.3 lb/cow**
  - **P = 9.0 lb/cow**
  - **K = 13.6 lb/cow**

<u>Un-Managed</u>

- N loss from manure*
  - **N = 181 lb/cow**