

# Group Formulation using UPENN Ration Analyzer

**UPenn Dairy Ration Analyzer**  
**University of Pennsylvania**

Center for Animal Health and Productivity
v2013.1031a  
11/4/2013

Group settings

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Feedbank

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Ration

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Formulate ration

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Reports

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 Ask Spot

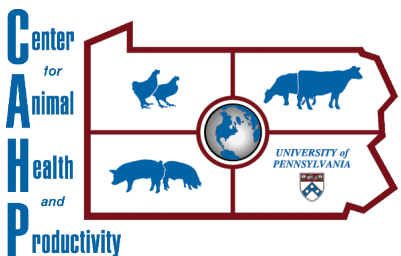


Ctrl+Shift+H	Return to this page
Ctrl+Shift+P	Peptide toggle
Ctrl+Shift+L	Liquid passage toggle
Ctrl+Shift+R	Evaluation report
Ctrl+Shift+S	Hide/Show sheets
Ctrl+Shift+E	Enzyme toggle
Ctrl+Shift+T	Toggle Linear
Ctrl+Shift+N	Toggle ProtB3 Rate

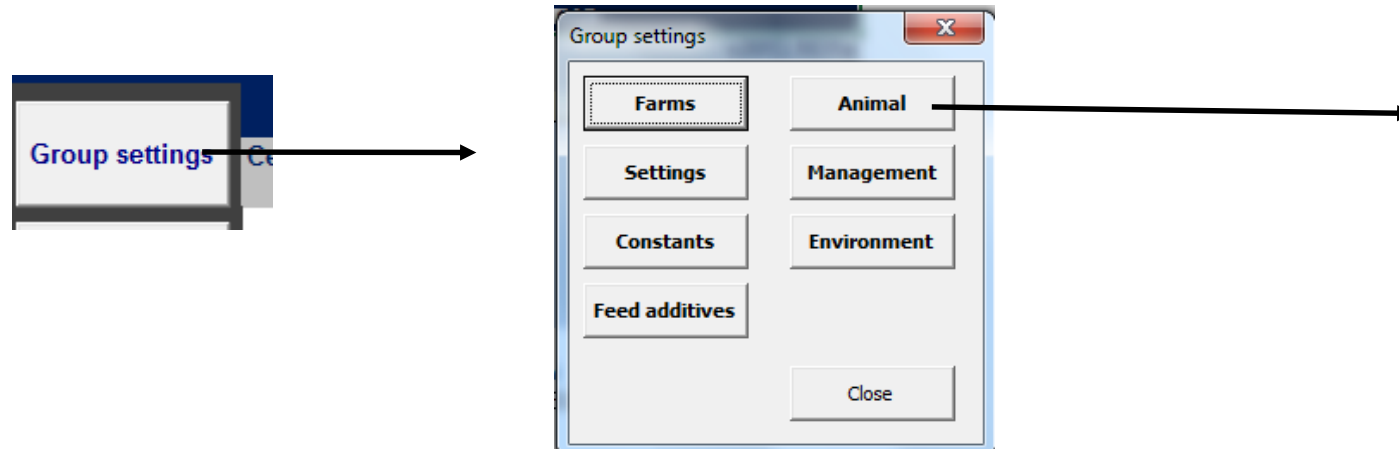
BETA   
 BETA   
 BETA   
 BETA

Based on CPM 3.0.8.1

**Model is using:**  
 Standard liquid passage rate  
 Using peptide submodel  
 NFC value used  
 Sheets visible  
 No enzyme  
 UPenn Method Modified Linear  
 ProtB3 Rate



# Group Formulation using UPENN Ration Analyzer



Selecting Group Settings Tab opens to Select Animal Tab  
Animal Can be described  
Typically formulation is based on an individual animal describing the group to be fed.

The 'AME Inputs' dialog box is shown with the 'Animal' tab selected. It contains several sections of input fields:

- Animal Type:** Radio buttons for Heifer, Lactating (selected), and Dry.
- Growth:** A checked 'Default' checkbox and a text field containing '6.387692E-02' with 'kg/d' units.
- Age/Weight:** Text fields for Lactation (2), Current age (37 months), First calving age (24 months), Calving interval (13 months), Current weight (605 kg), Mature weight (657.6 kg), Calf birth weight (40.8 kg), Days pregnant (50), and Body condition score (3).
- Production:** Text fields for Milk (40 kg/d), Price (0 \$), Fat (3.5 %), and Days in milk (120).
- Protein:** Radio buttons for Crude and True (selected), and a text field for True protein (3.1 %).

At the bottom, there is a text field for 'High Group 1' and 'Cancel' and 'OK' buttons.

An example diet formulated for a 90 lb Holstein cow with 3.5% fat and 3.1% true protein in milk  
 Lactation 2; 1334 lb body weight; 120 days in milk  
 Temperate weather conditions and housed in a small free stall barn

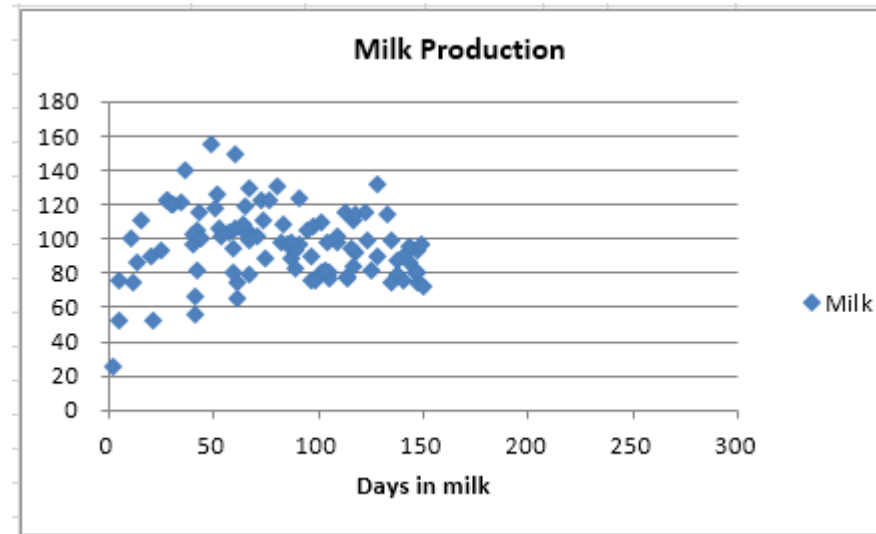
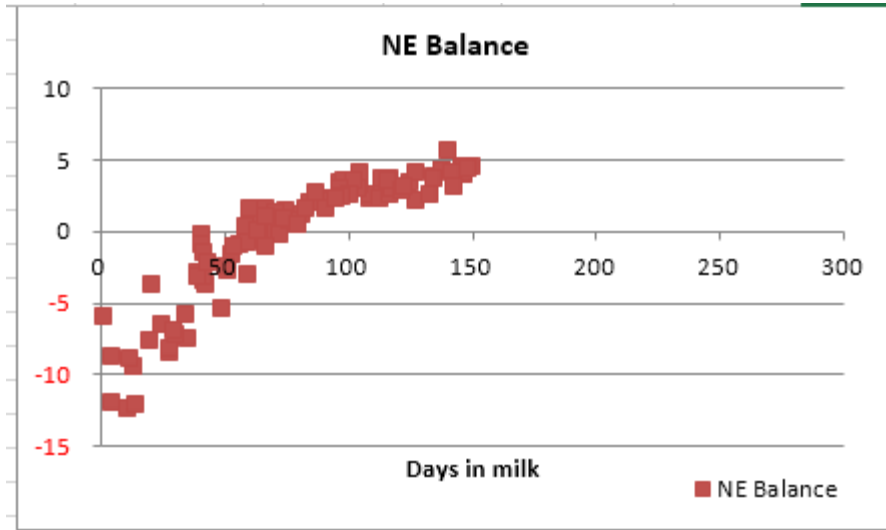
Feed	Input	Units	lbsAF (2)	lbsDM (4)	kgAF (1)	kgDM (3)	DM basis	Feed DM
0AlfHy20Cp37Ndf17LNdf	4.0000	lbs/DM	4.44	4.00	2.0156	1.8141	7.8%	90.0%
0CrmSilPr35Dm41NdfCrse	25.0000	lbs/DM	71.43	25.00	32.3939	11.3379	48.6%	35.0%
0CornGrainGrndFine	5.9911	lbs/DM	6.81	5.99	3.0876	2.7171	11.6%	88.0%
0MolassesCane	0.0000	lbs/DM	0.00	0.00	0.0000	0.0000	0.0%	73.0%
0MinVit	1.0000	lbs/DM	1.05	1.00	0.4774	0.4535	1.9%	95.0%
0SoybeanHullsPellet	3.6695	lbs/DM	4.03	3.67	1.8288	1.6642	7.1%	91.0%
0SoybeanML47.5Solv	6.2042	lbs/DM	6.89	6.20	3.1263	2.8137	12.1%	90.0%
0BloodMeal	0.7824	lbs/DM	0.87	0.78	0.3943	0.3548	1.5%	90.0%
0RyeGsSil15Cp58Ndf8LNdf	3.7695	lbs/DM	10.77	3.77	4.8843	1.7095	7.3%	35.0%
0SaltNaCl	0.2500	lbs/DM	0.25	0.25	0.1139	0.1134	0.5%	99.5%
0SodiumBicarbonate	0.2500	lbs/DM	0.25	0.25	0.1139	0.1134	0.5%	99.5%
0MFP	0.0333	lbs/DM	0.03	0.03	0.0153	0.0151	0.1%	99.0%
0LimestoneGrnd	0.2000	lbs/DM	0.20	0.20	0.0912	0.0907	0.4%	99.5%
0MagOx	0.1000	lbs/DM	0.10	0.10	0.0456	0.0454	0.2%	99.5%
0VitaminPremixADE	0.1000	lbs/DM	0.10	0.10	0.0456	0.0454	0.2%	99.5%
0TraceMineralPremix	0.1000	lbs/DM	0.10	0.10	0.0456	0.0454	0.2%	99.5%

Ration Evaluation with standard set-up to be equal to CPMDAIRY, except MP efficiency set to 67.5%

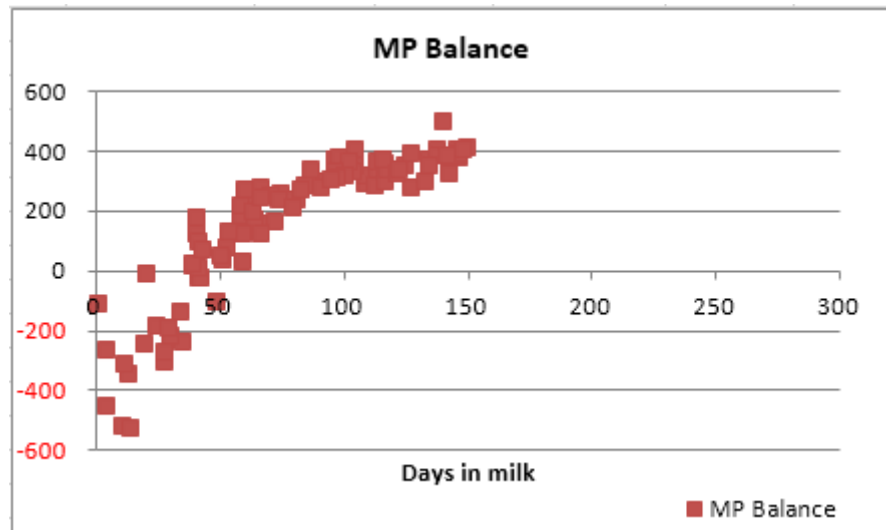
Evaluation Report						Standard liquid passage rate	
Farm name: Back 40 Acres				Date: 02/29/2008		Using peptide submodel	
Group: High Group 1						NFC value used	
Ration by: Neddy Eccles : CAHP						No enzyme	
BW:	1334 lbs			DIM:	120	CPM Method NonLinear	
BCS:	3			Milk:	90.00 lbs	ProtB3 Rate	
Growth	0.14 lbs/d			Fat:	3.50 %		
Lactation:	2			True protein:	3.10 %		
Cost	\$7.35	IOF	-\$7.35				
DMI (lbs/d)	51.5	pDMI (lbs/d)	49.7	DMI % Pred	103.5		
ME Bal (mcal)	0.0	CP (%)	16.5	NDF	32.3	%DM	
MP Bal (g)	-0.0	RUP (%CP)	39.0	ForageNDF	80.1	%NDF	
NP/MP (%)	67.5	LCFA (%)	2.2	ForageNDF	25.9	%DM	
BactMP (%MP)	51.8	EE (%)	3.2	peNDF	24.3	%DM	
				Lignin	2.4	%DM	
Rumen N Balance				NFC	39.2	%DM	
Pept (g)	45	Pep&NH3 (g)	78	Sil Acids	3.9	%DM	
% rqd	123	% rqd	121	Sugar	3.7	%DM	
				Starch	26.6	%DM	
Amino Acid Balance				Sol Fiber	4.9	%DM	
Met (g)	7.2	Lys (g)	25.9				
Met (% rqd)	115	Lys (% rqd)	116				
Met (% mp)	2.12	Lys (% mp)	7.01	Lys:Met	3.30:1		







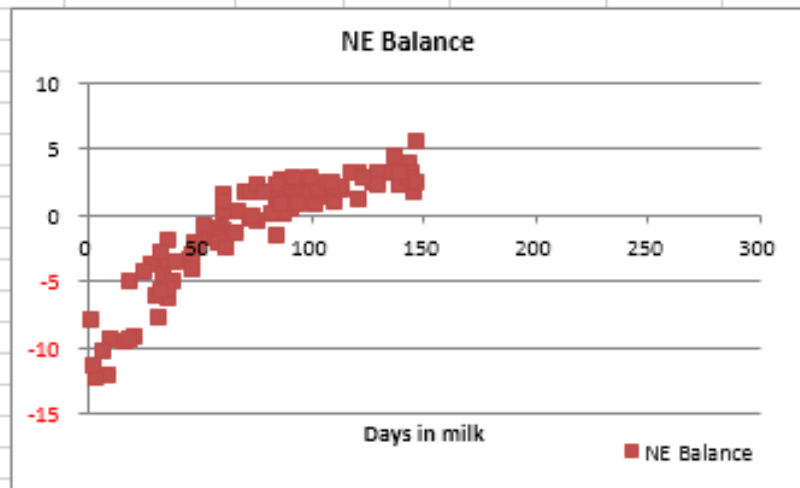
Majority of cows  
Should be 80 to  
120 lbs of milk/day  
In the group



Predicted NE balance, MP balance and range in milk production expected for the group based on RHA and range in DIM and lactation number of the group

Maximum NE balance is largely above -10 mcal and a few cows will be below -10 mcal but not below -15 mcal  
Cows should be in positive balance by 50 DIM and asymptote around 4 mcal/day

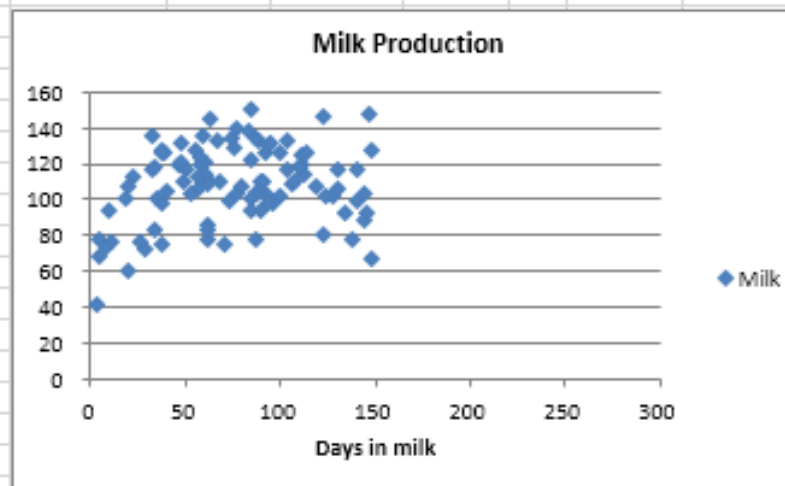
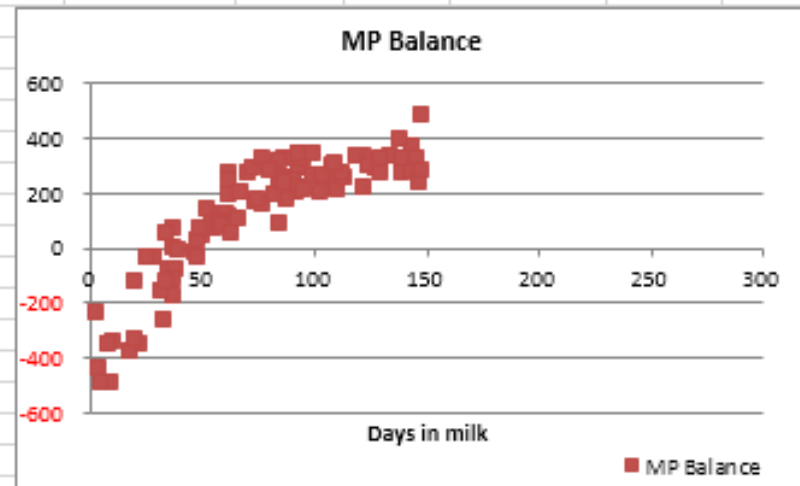
MP balance a few cows will be below -400 g/d and should be in Positive balance by 50 DIM and asymptote at 400 g positive balance



Inputs					
Breed	Holstein	Group	1		
RHA	28000	12	DIM Min	1	
Lactation	2: Mix	2	DIM Max	150	
B. Wt, lb B. Wt, kg percent					
Lact 1	1200	544.2	30	CurrWt	1334.0
Lact 2	1350	612.2	32	MatureWt	1450.0
Lact 3	1400	634.9	19		
Lact 4	1450	657.6	19		
mean wt	1333.5	604.8	604.9		
Scaler					
	means	all cows			
DMI	1	56.8823			
MILK	1	108.0452	91.8384		
FAT, %	1	3.4718			
PROT, %	1	2.8061			
Milk Variance	0.14	0.1971	CV target 25 to 30%		

If RHA is 28,000 lb milk  
Should be between 80 to 140 lbs

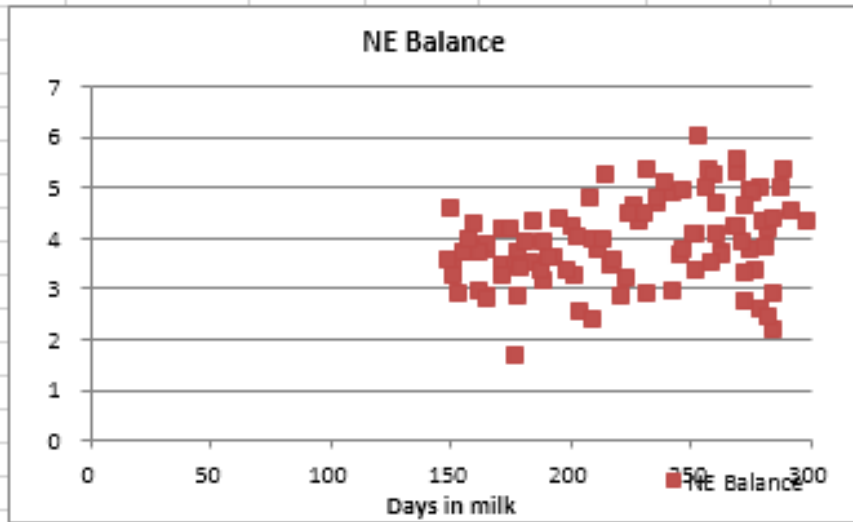
More cows will be  $\leq -10$  mcal and positive energy balance will not be reached until 70 DIM or slightly later.



MP balance is less influenced than ME. Cows are still in positive balance by 50 days but only about 300 g in positive balance. A few cows will be below -400 g MP balance in early lactation

This diet fed to a group producing 108 lbs of milk would be energy limiting

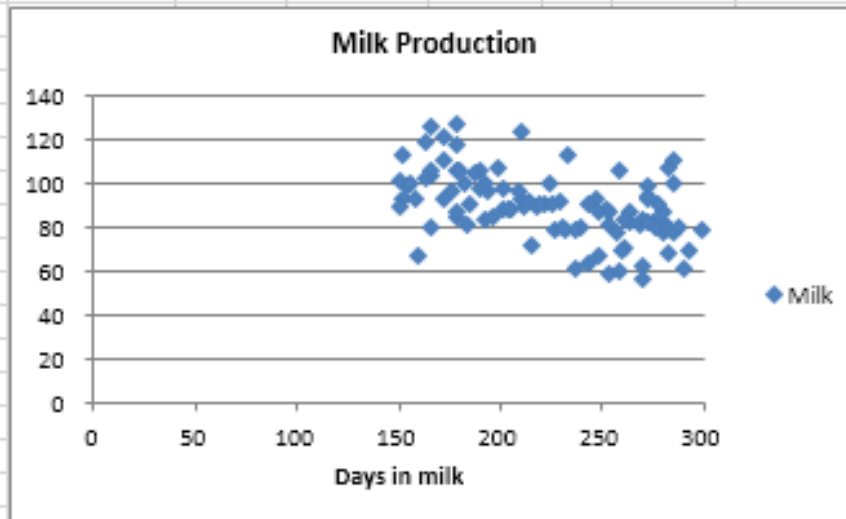
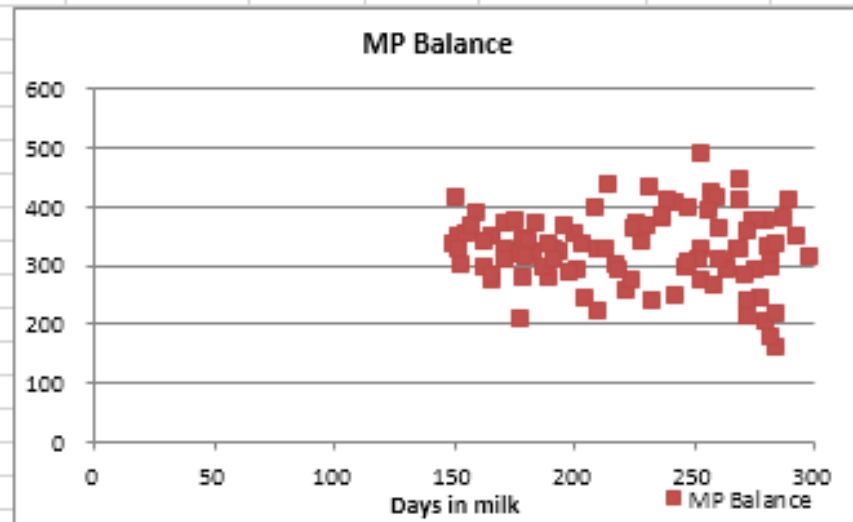




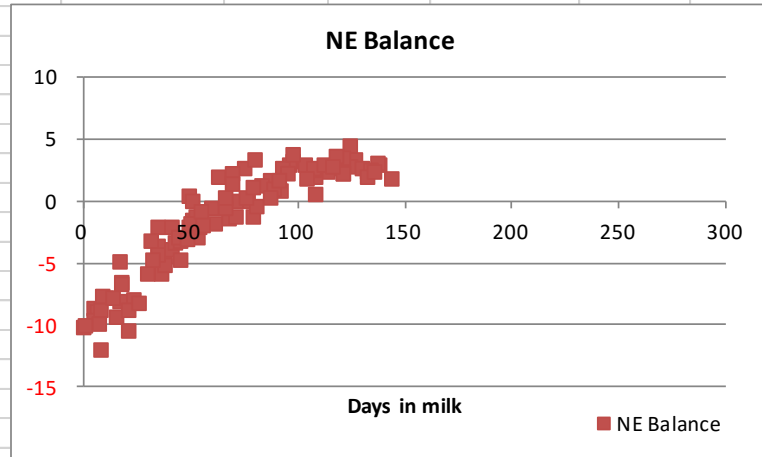
inputs					
Breed	Holstein		Group	1	
RHA	28000	12	DIM Min	150	
Lactation	2: Mix	2	DIM Max	300	
B. Wt, lb B. Wt, kg percent					
Lact 1	1200	544.2	30		
Lact 2	1350	612.2	32		
Lact 3	1400	634.9	19		
Lact 4	1450	657.6	19		
mean wt	1333.5	604.8	604.9		
				press F9 to recalc	
Scaler means all cows					
DMI	1	57.17			
MILK	1	89.48	76.06		
FAT, %	1	3.59			
PROT, %	1	3.07			
Milk Variance	0.14	0.1709	CV target 25 to 30%		

This diet fed to cows 150 to 300 DIM would be positive in energy balance and MP Balance

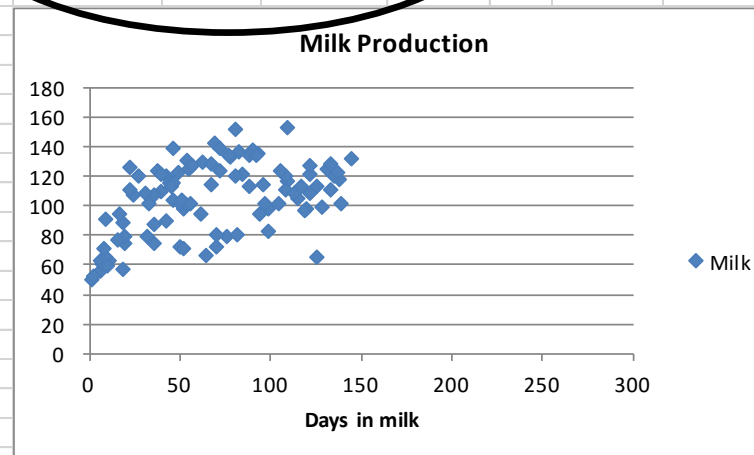
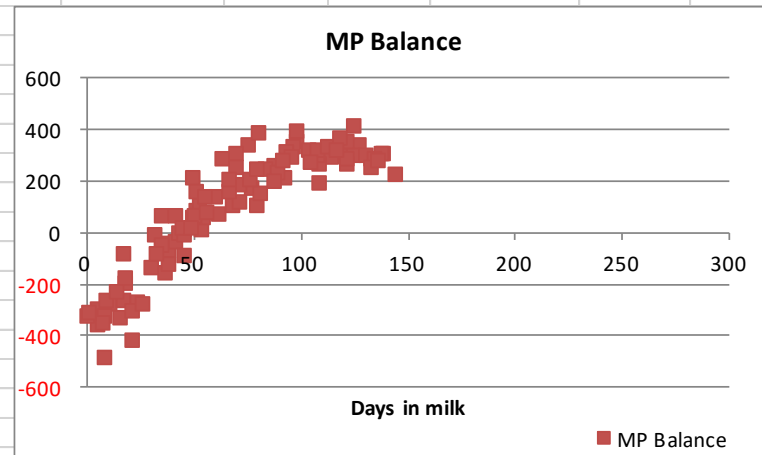
Ration should be adjusted to Reduce energy and protein content



# Scaler buttons



Inputs				
Breed	Holstein		Group	1
RHA	28000	12	DIM Min	1
Lactation	2: Mix	2	DIM Max	150
	<b>B.Wt, lb</b>	<b>B.Wt, kg</b>	<b>percent</b>	
Lact 1	1200	544.2	30	CurrWt 1334.0
Lact 2	1350	612.2	32	MatureWt 1450.0
Lact 3	1400	634.9	19	
Lact 4	1450	657.6	19	
mean wt	1333.5	604.8	604.9	
				<b>press F9 to recalculate</b>
Scaler				
		<b>means</b>	<b>all cows</b>	
DMI	1	54.60		
MILK	1	104.73	89.02	
FAT, %	1	3.50		
PROT, %	1	2.81		
Milk Variance	0.14	0.2346	CV target 25 to 30%	



If your herd group has higher DMI, milk production, fat and protein % (or lower) then by writing 1.01 or higher or 0.99 or lower you can scale the mean values to match your herd group. This will change the ME and MP balances.

The Milk variance, 0.14, adjusts the range in production for the group. The 0.2346 is the coefficient of variation (CV) based on the Variance input. Across a herd, the CV for milk is typically 20% to 25%. Within a group CV is 12 to 20%, lower values typically in earlier lactation groups. Late groups may approach 30%.

# Comparison of DHIA Group Milk and Group Evaluation

DHIA Test day day for Group 10

First lactation cows

DIM 47 to 335; mean 135 days +/- 69

Average milk 76.65 lbs, 3.93% Fat, 3.2% Prot

Group Evaluation Select First lactation; 50 to 200 DIM range

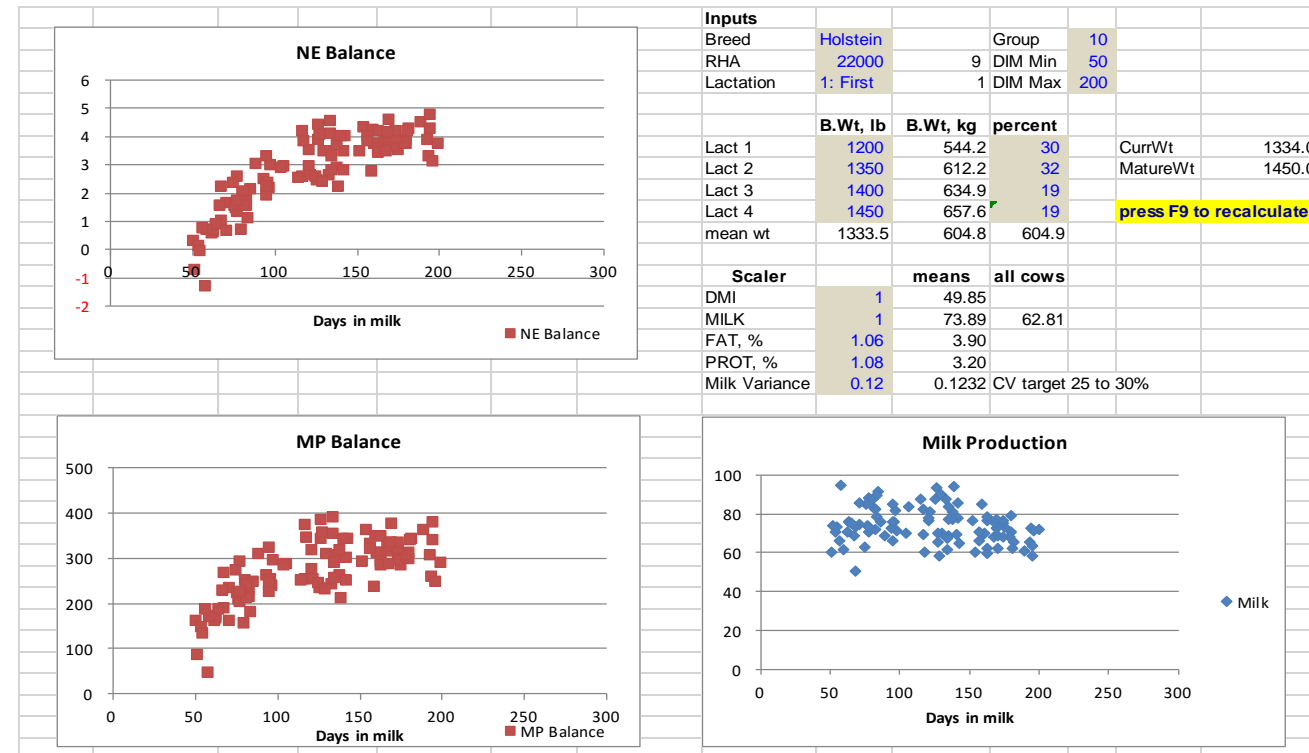
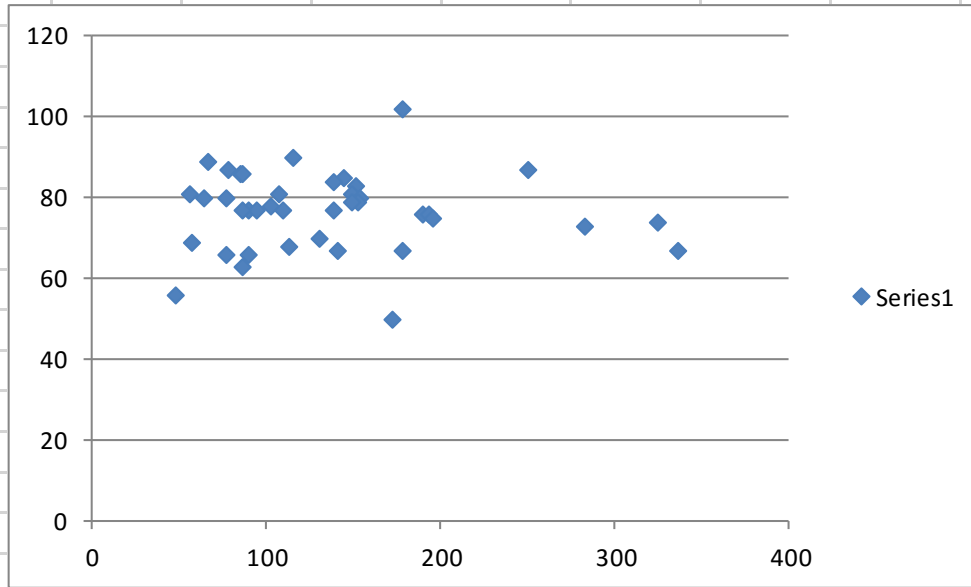
RHA 22,000 gives range in milk

Scale fat 1.06 and protein 1.08, variance 0.12

Milk average 73.89, Fat 3.90%, Prot. 3.20%

Milk should range 60 to 90 lbs with a few cows close to 100 and a few below 60. NE balance slight negative to 3 to just under 5mcal; MP balance just above 0 to 250 to 400 g positive

	group	milk	fat	prot	dim
means	10	76.65	3.9275	3.2	135.3
stdev	40	9.688878	0.730643	0.408876	69.12427
cv		0.126404	0.186033	0.127774	0.510896



# Postcalving group

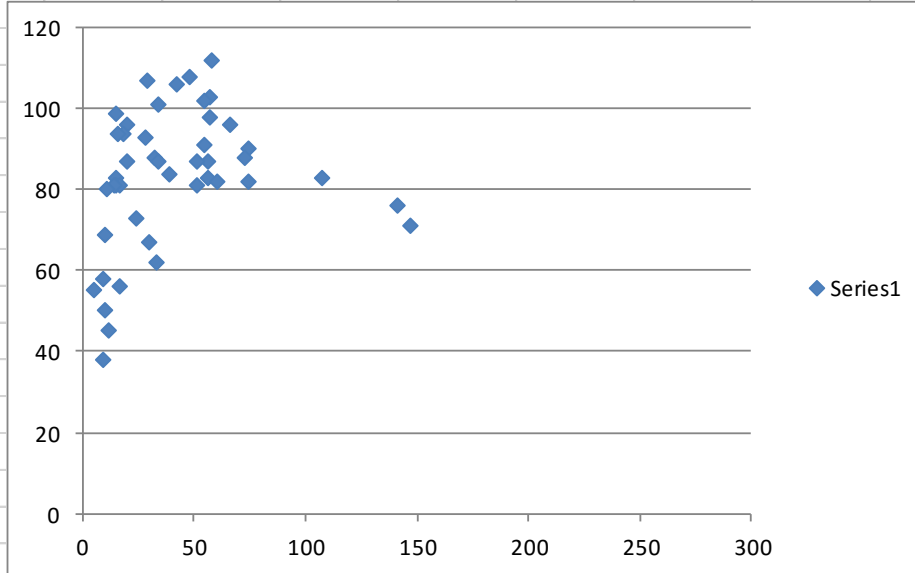
DHIA Test day day for Group 22

Mixed lactation

DIM 5 to 147; mean 41 days +/- 32

Average milk 83 lbs, 4.34% Fat, 2.98% Prot

	group	milk	fat	prot	dim	lact	range dim
means	22	83	4.34186	2.981395	40.97778	2.644444	5
stdev	45	17.15835	0.703133	0.324592	32.19083	1	147
cv		0.206727	0.161943	0.108872	0.785568	6	



Group Evaluation Select Mixed lactation; 1 to 70 DIM range

RHA 22,000 gives range in milk

Scale Milk 0.9, fat 1.018 and protein 1.04, variance 0.04

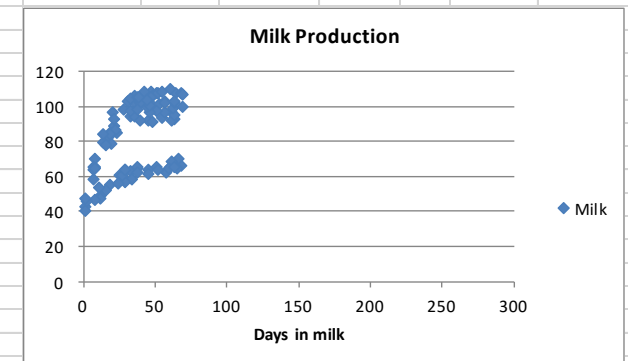
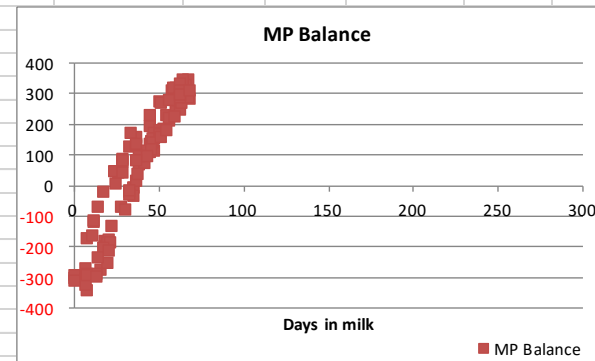
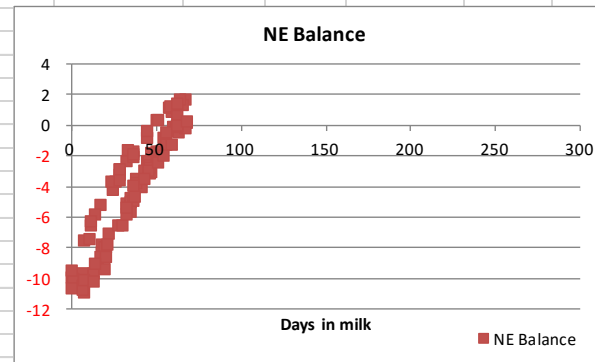
Milk average 82, Fat 4.33%, Prot. 2.98%

Milk should range 40 to 100+ lbs and be lactation dependent

NE balance a few cows below -10 mcal and 0 balance after 50 days;

MP balance around -300 g and positive before 40 days

Inputs			
Breed	Holstein	Group	22
RHA	22000	9 DIM Min	1
Lactation	2: Mix	2 DIM Max	70
B.Wt, lb		B.Wt, kg	percent
Lact 1	1200	544.2	30
Lact 2	1350	612.2	32
Lact 3	1400	634.9	19
Lact 4	1450	657.6	19
mean wt	1333.5	604.8	604.9
CurrWt		1334.0	
MatureWt		1450.0	
press F9 to recalculate			
Scaler		means	all cows
DMI	1	46.56	
MILK	0.9	82.29	69.94
FAT, %	1.18	4.33	
PROT, %	1.04	2.98	
Milk Variance	0.04	0.2473	CV target 25 to 30%



# Guidelines

- Negative Energy Balance
  - No cows <-15 mcal
  - <20% below -10 mcal
- Positive energy balance
  - Positive balance by 50 days postpartum
  - asymptote to 5 mcal positive balance
- Negative protein balance
  - No cows <-600 MP g/d
  - <20% of cows <-400 MP g/d
- Positive protein balance
  - Positive protein balance by 50 days or earlier
  - Positive balances of MP will be 400 g to 600 g/day