

Heifer rearing cost: Critical control points



Patrick Hoffman
Vita Plus Corp., Madison-WI



Calf Summit 2016



Heifers: Key Assumption Feed Cost Updates



Feed Costs per ton DM:	2013	2015
Legume Silage	\$200	\$150
Corn Silage	\$140	\$100
Corn	\$250	\$170
Weigh-backs	\$150	\$100
Soybean Meal	\$375	\$350

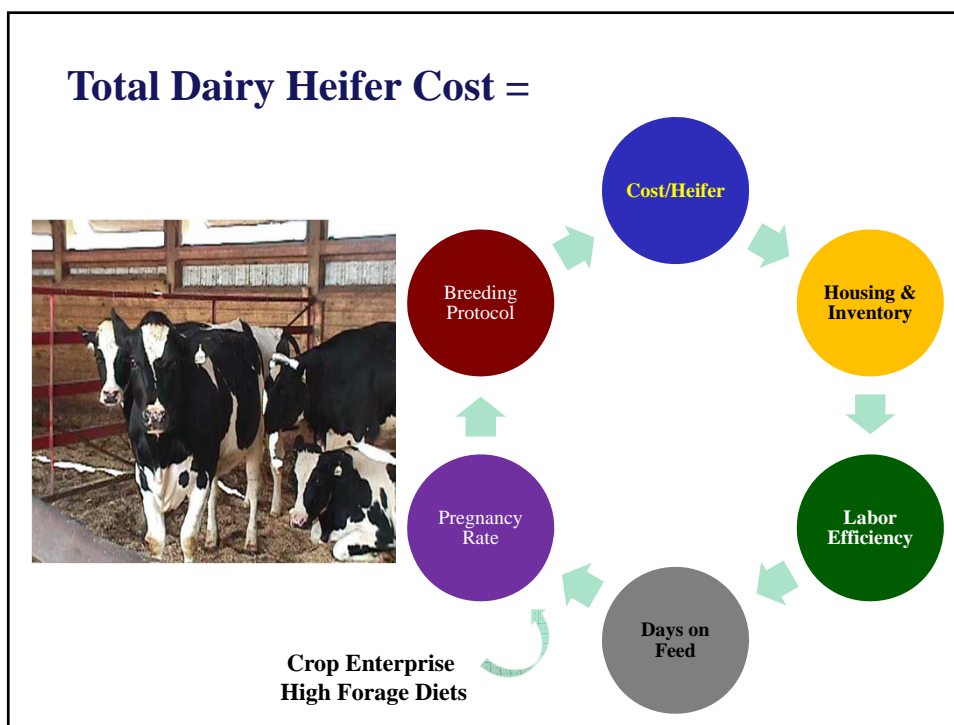


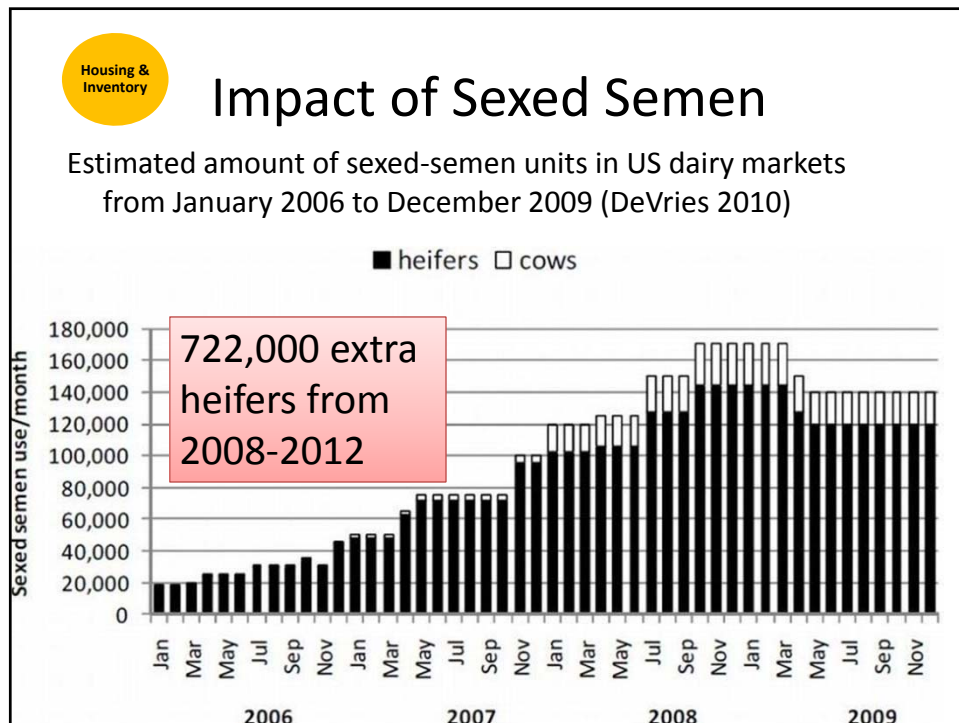
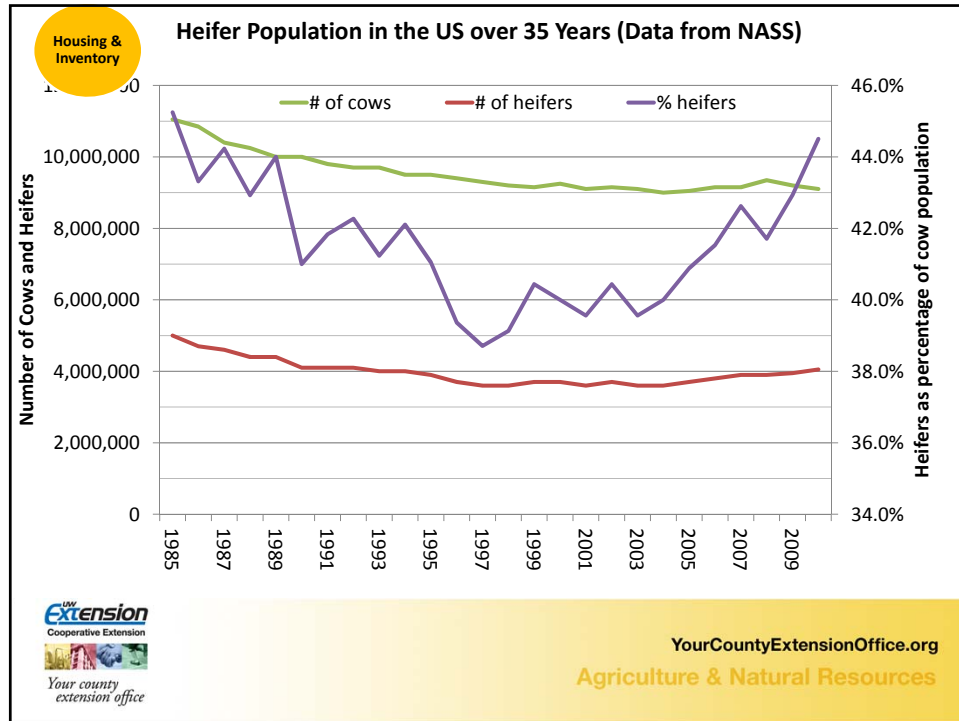
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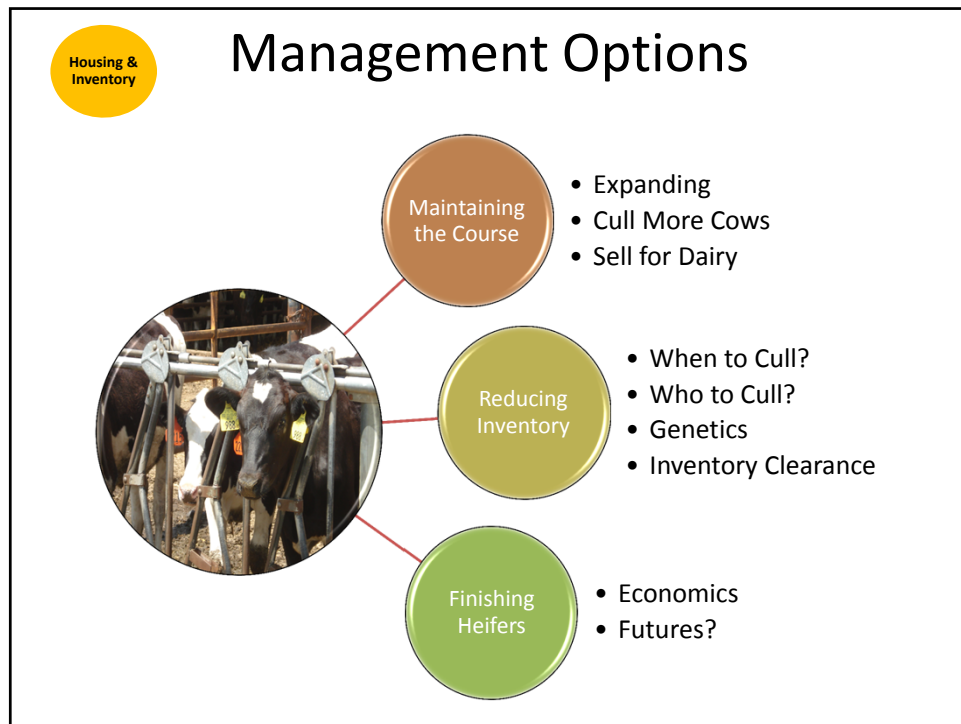
Cost of Raising a Heifer in Wisconsin*				
	1999	2007	2013	2015
Total Cost	\$1099.12	\$1322.70	\$1905.13	\$1730.29
Daily Cost	\$1.61	\$2.04	\$3.07	\$2.75
Days on Feed	683	648	630	630

*Does not include calf value

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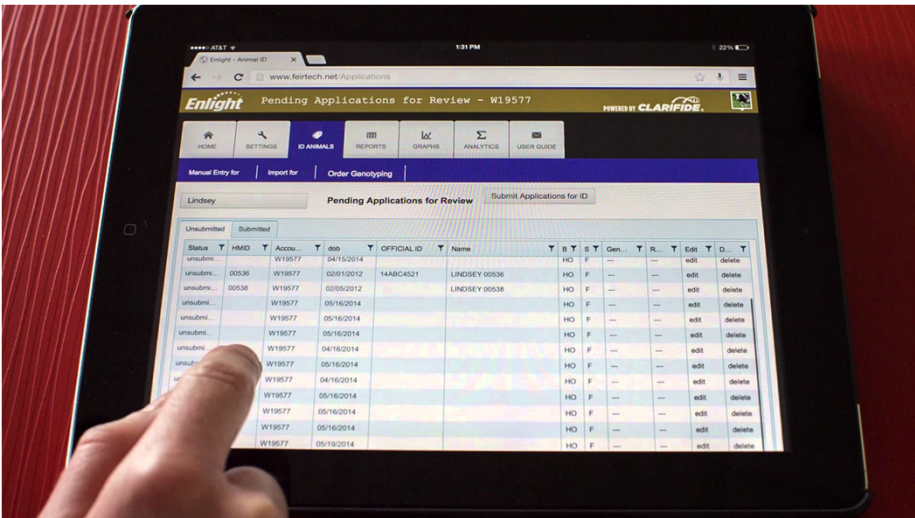




Housing & Inventory

Genomic Lab Results

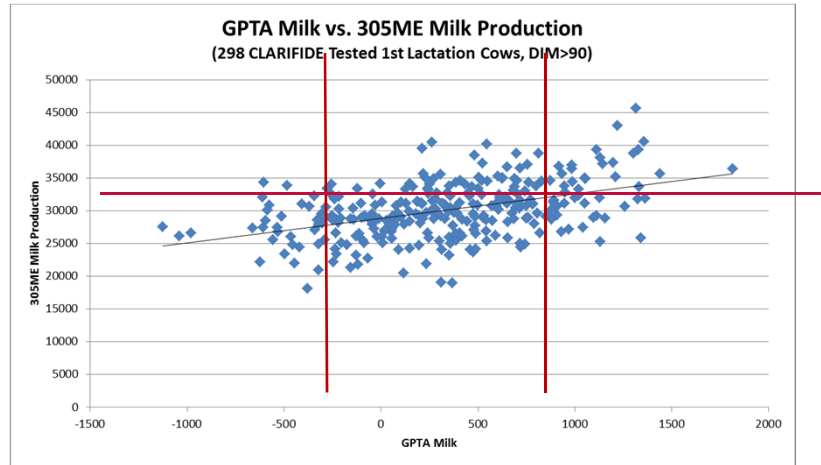
* Samples Due 1st of Month
* Lab Turnaround = 30-40 days



Status	HMD	Accou	Date	OFFICIAL ID	Name	Sex	Breed	Genotype	Other	Edit	Delete
unsubmitted	00036	W19577	02/01/2012	14ABC4321	LINDSEY 00036	HO	F	---	---	edit	delete
unsubmitted	00036	W19577	02/05/2012		LINDSEY 00036	HO	F	---	---	edit	delete
unsubmitted		W19577	05/16/2014			HO	F	---	---	edit	delete
unsubmitted		W19577	05/16/2014			HO	F	---	---	edit	delete
unsubmitted		W19577	05/16/2014			HO	F	---	---	edit	delete
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Housing
&
Inventory

Herd Response to Genetic Selection

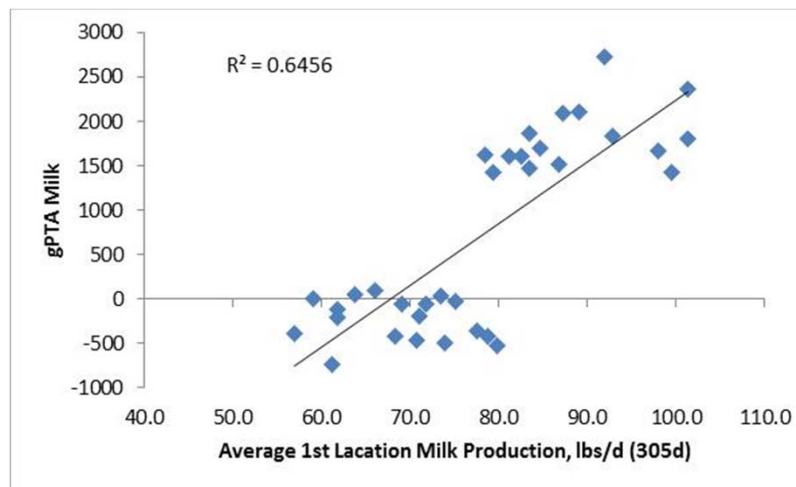


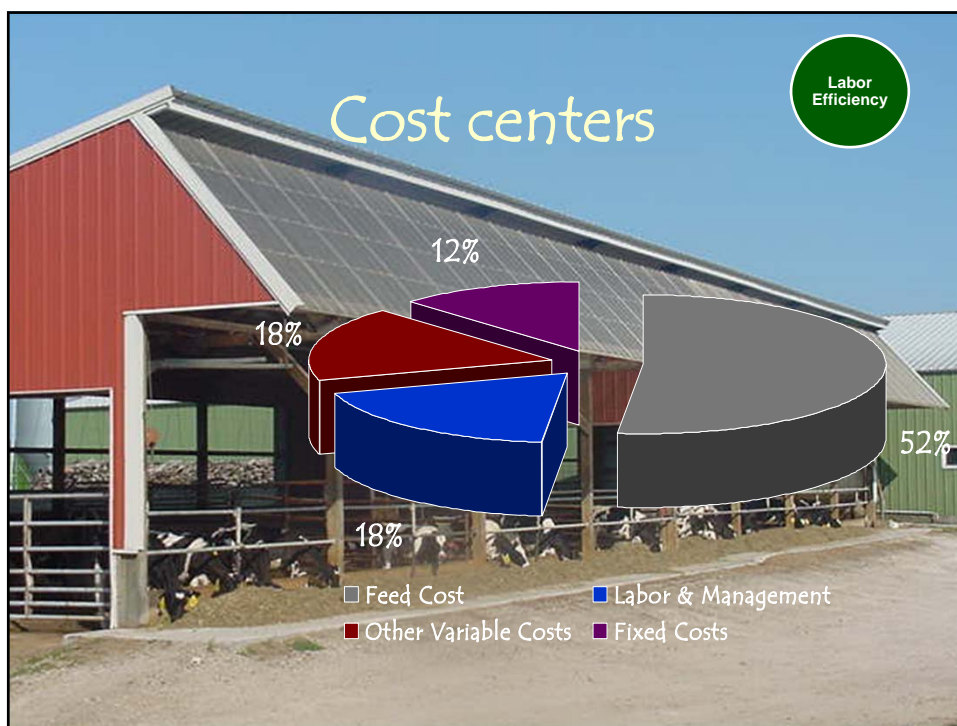
305ME Production = $28847 + 3.8 \times \text{GPTA Milk}$
Correlation = 0.45

Observed 3.8lbs/GPTA Milk
Expected 2lbs/GPTA Milk

Housing
&
Inventory

Genomics = the top and the bottom. A dairy can't cull all their heifers!





1000

1000

Labor Efficiency

Dairy 1

Dairy 2

6.5

14.0

3.0

12.0

4.0

20.0

Weekly Mgmt

2.0

1.0

5.0

20.0

20.0

12.5

200

105

2,960.5

6,383.5

123.3

57.2

986.3

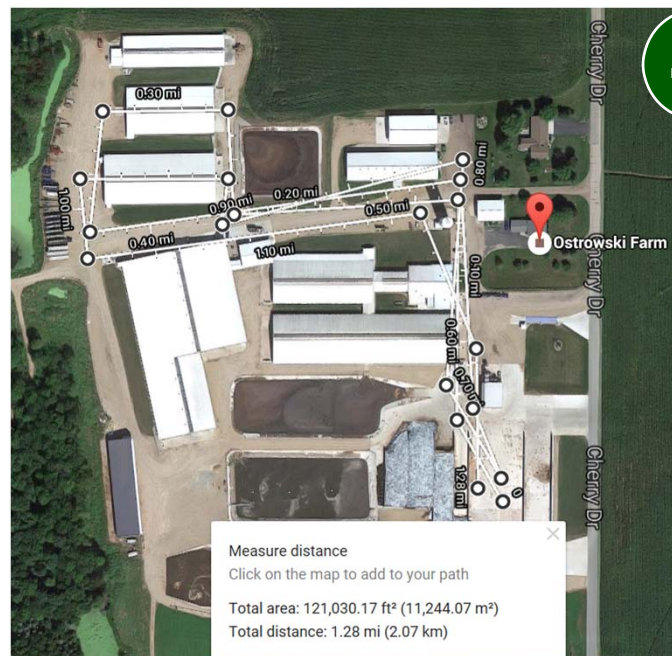
457.4

59.2

127.7

59,210.00 127,670.00

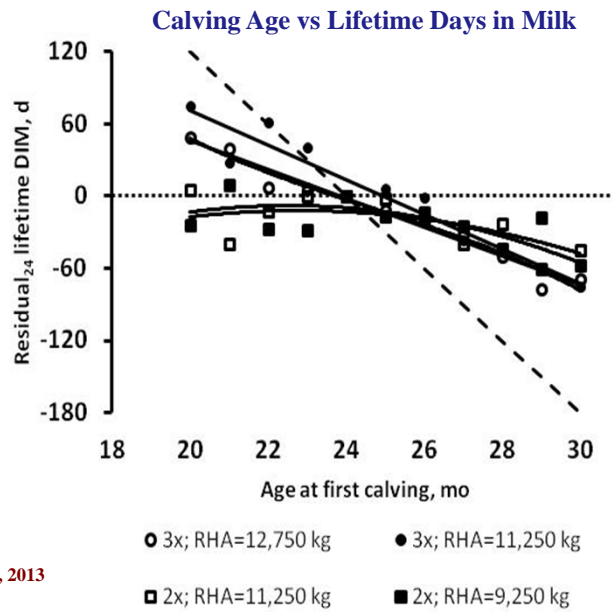
127,670.00



Labor Efficiency



Calving Age = Days on Feed

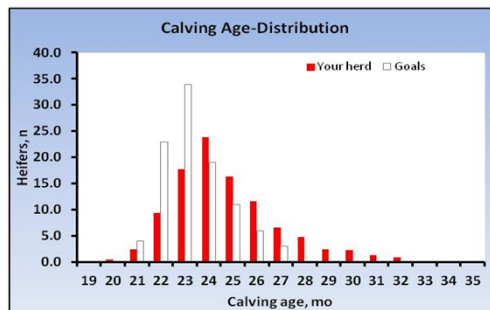


Curran et al., 2013

Days on Feed

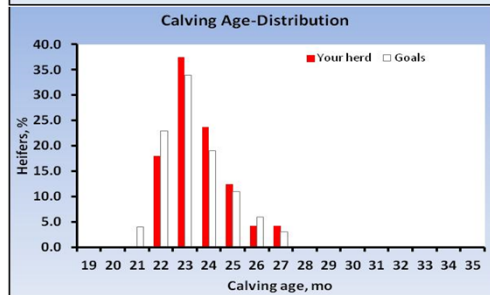
Days on Feed = Breeding Protocol/Preg Rate

Herd A



Preg Rate = 29.0 %

Herd B



Preg Rate = 45.0 %

Pregnancy Rate

Modern Breeding Criteria: Controls days on feed

Breeding
Protocol

Example

- No variance calving age	23.4 mo
- Min breeding age	13 mo
- Max breeding age	16 mo
	(– AI = 3 straw max)
- HH carrier	HH free bulls
- Pre-breeding BW	> 825 lbs (12 mo)
- Light BW @ 12 mo	Cull & Fix
- Heavy BW @ 12 mo	DNB & Monitor Energy
- Low genomics/disease	DNB & Cull
- Sexed semen	Yes

Feed Cost Control

Bunk Management

- * Daily Bunk Scores
- * Controlled DMI Adjustments
- * Feed Shrink Protection System
- * No Feed Loss (Goal)





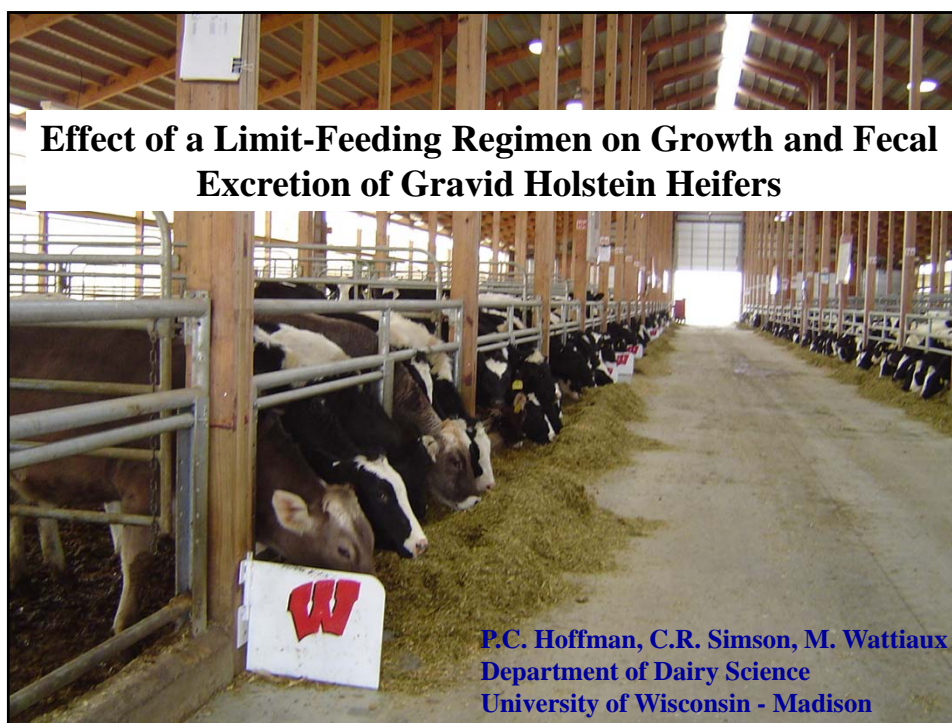


Table 2. Nutrient and energy intake of heifers fed treatment diets.

Item	Treatment ¹		
	C-100	R-90	R-80
Nutrient intake, lbs/d			
DM	21.3	19.9	18.3
CP	2.42	2.54	2.57
NDF	10.06	8.29	6.50
Non-fiber carbohydrate	7.26	7.60	7.85
P	0.057	0.058	0.058
Ca	0.086	0.090	0.089
Energy intake ³			
TDN, lbs/heifer/d	14.4	13.9	13.5
NE _g , Mcals/d	9.4	9.4	9.5
NE _m , Mcals/d	13.7	13.3	13.0

Hoffman et al. 2005

Table 3. Effect of dietary regimen on body size and growth of replacement heifers.

Item	Treatment ¹		
	C-100	R-90	R-80
Initial			
Weight, lbs	1036	1021	1011
Hip height, in	54.20	54.60	54.90
Body condition score	3.1	3.0	2.9
Final			
Weight, lbs	1220	1234	1217
Hip height, in	56.0	56.3	56.4
Body condition score	3.2	3.2	3.2
Growth			
Average daily gain, lbs/d	1.66	1.92	1.84
Feed efficiency, lbs DM/lb gain	13.2	10.7	11.1
Excretion			
DM, lbs/d	7.7	6.9	5.8

Hoffman et al. 2005

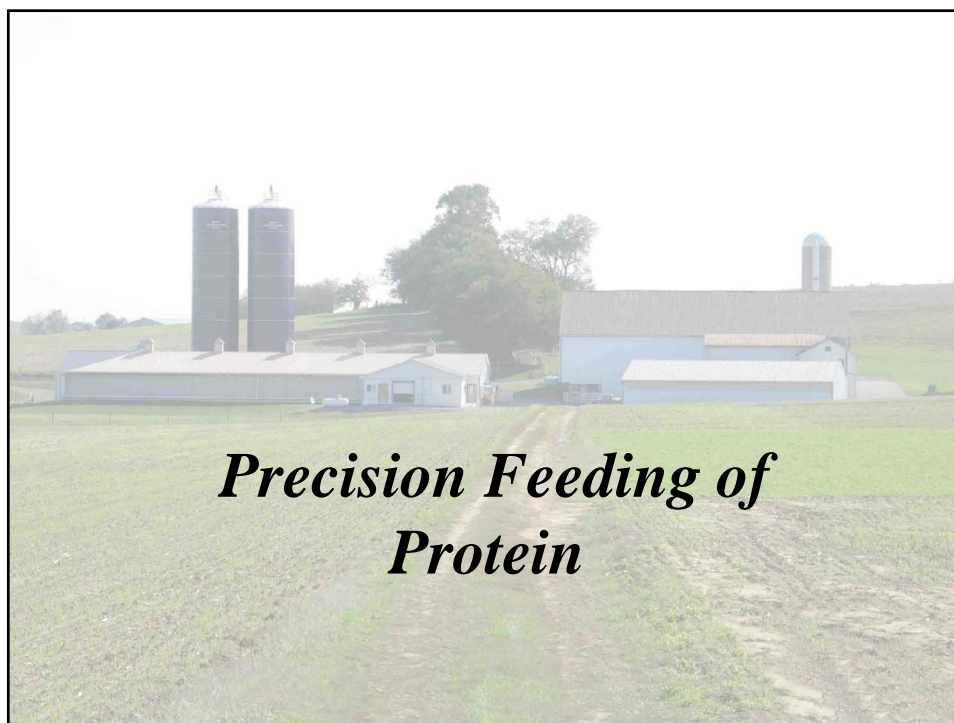
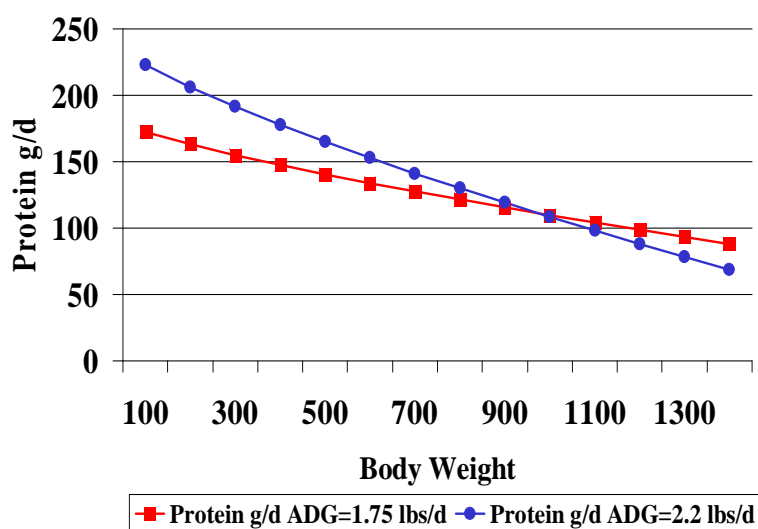
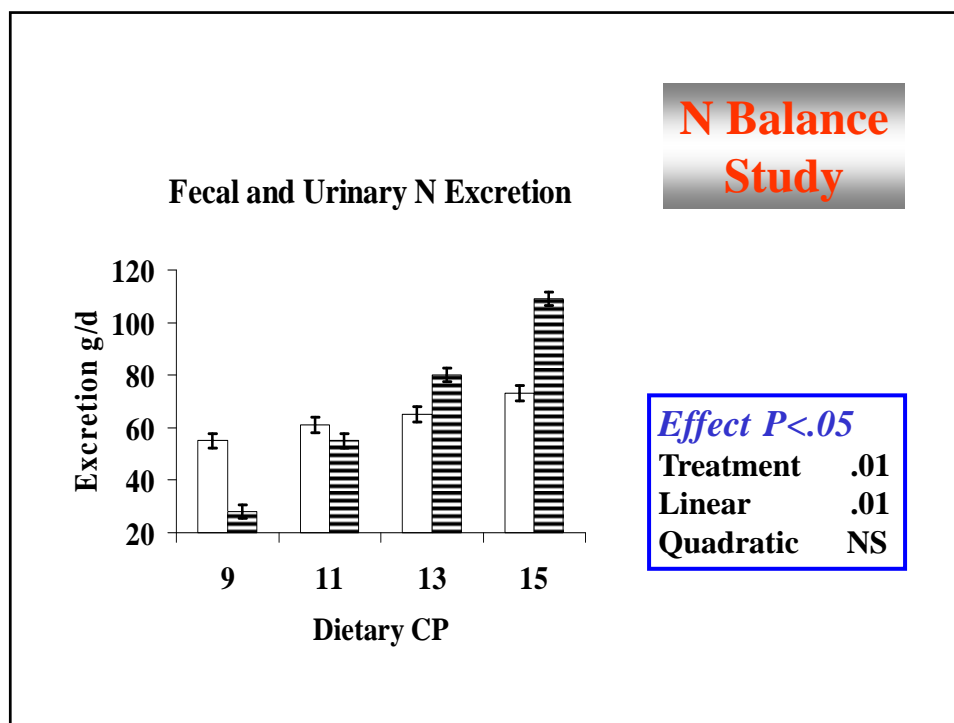


Figure 2. Relationship between ADG and protein deposition in Holstein heifers

Table 1. Dietary energy and protein guidelines¹ for large breed dairy heifers gaining 1.8 lbs/day in a thermal neutral environment.

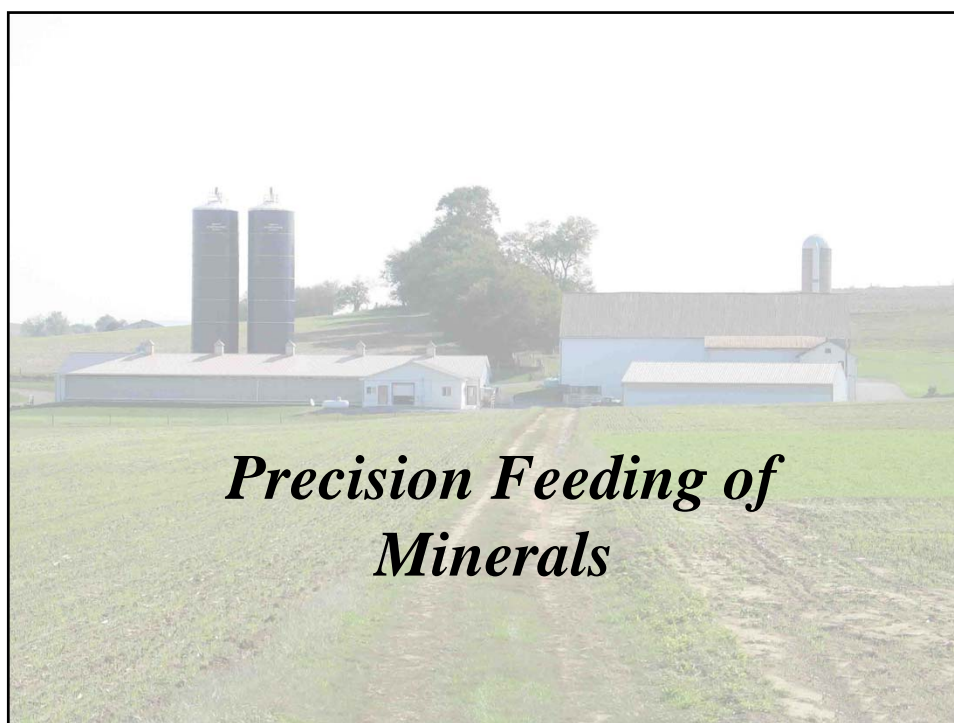
Item	Unit	Abbreviation	Heifer Body Weight, lbs			
			300	600	900	1200
Dry Matter Intake	lbs/d	DMI	9.3	13.7	19.4	26.9
Crude Protein	% of DM	CP	16.9	15.0	14.2	13.3
Rumen-Undegraded Protein	% of CP	RUP	39.4	33.8	30.3	26.3
Rumen-Degraded Protein	% of CP	RDP	60.6	66.2	69.7	73.7
Total Digestible Nutrients	% of DM	TDN	67.4	65.3	63.3	62.3
Metabolizable Energy	ME	Mcal/lb	1.11	1.10	1.08	1.02

¹ Determined from the Nutrient Requirements of Dairy Cattle, 2001



Heifer Protein Nutrition

- * Feeding Excess Protein Does not Result in Enhanced Lean Growth
- * Feeding Excess Protein is an Expensive way to Reduce Dietary Energy
- * Feeding High Levels of Bypass Protein has not been Demonstrated to Improve Heifer Growth
- * Feeding Excessive Protein Results in Increased N Excretion
- * NRC Protein Requirements appear Reasonable



Mineral Feeding Adequacy of 660 lb Holstein Heifers in Wisconsin Dairy Operations (Zygarlicke and Hoffman, 2001)

Mineral	NRC (Adequacy) ¹		Mineral Nutrition Status ²		
	Lower	Upper	Deficient	Adequate	Excess
% of herds					
Macro-mineral, %of DM					
Ca	0.41	0.51	3	4	93
P	0.23	0.29	7	7	86
Mg	0.11	0.14	0	7	93
Cl	0.12	0.15	0	0	100
K	0.48	0.60	0	0	100
Na	0.08	0.10	27	10	63
S	0.20	0.25	37	47	16
Micro-mineral, mg/kg					
Cu	10	13	13	14	73
Fe	31	39	0	0	100
Mn	20	25	0	0	100
Zn	27	34	10	10	80

Take Home Messages – Heifer Cost

- **Assess and if feasible reduce heifer inventory**
- **Use genomic/genetic data to cull heifers**
- **Labor = 100/heifers/hr**
- **Pregnancy rates > 45 %**
- **Utilize a modern breeding criteria**
- **Insist that heifers consume all feed**
- **Reduce feed shrink**
- **Avoid excess protein/mineral supplementation**



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