Feeding Management with Low Milk Prices

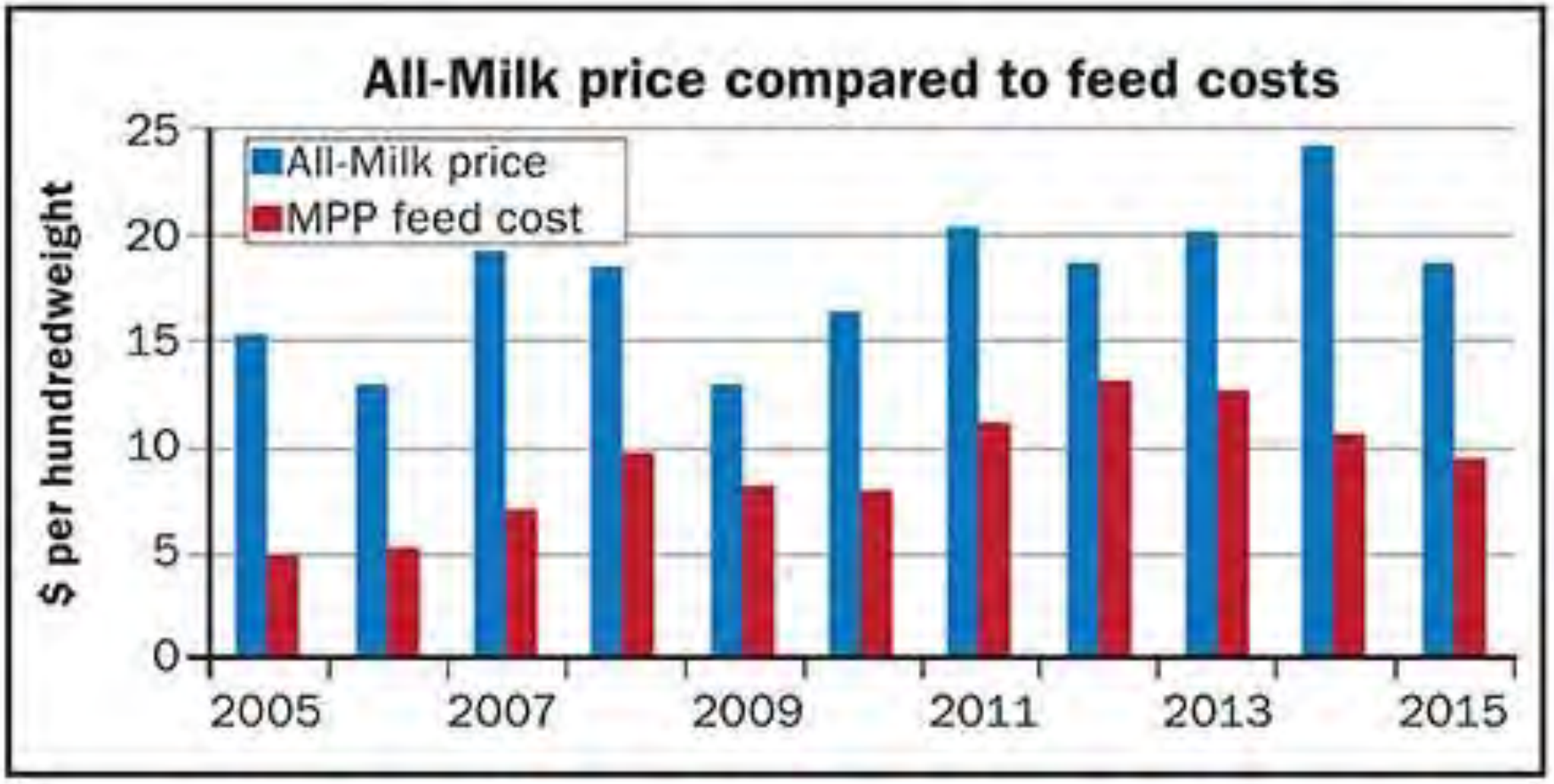
José E. P. Santos and Charles Staples

Department of Animal Sciences

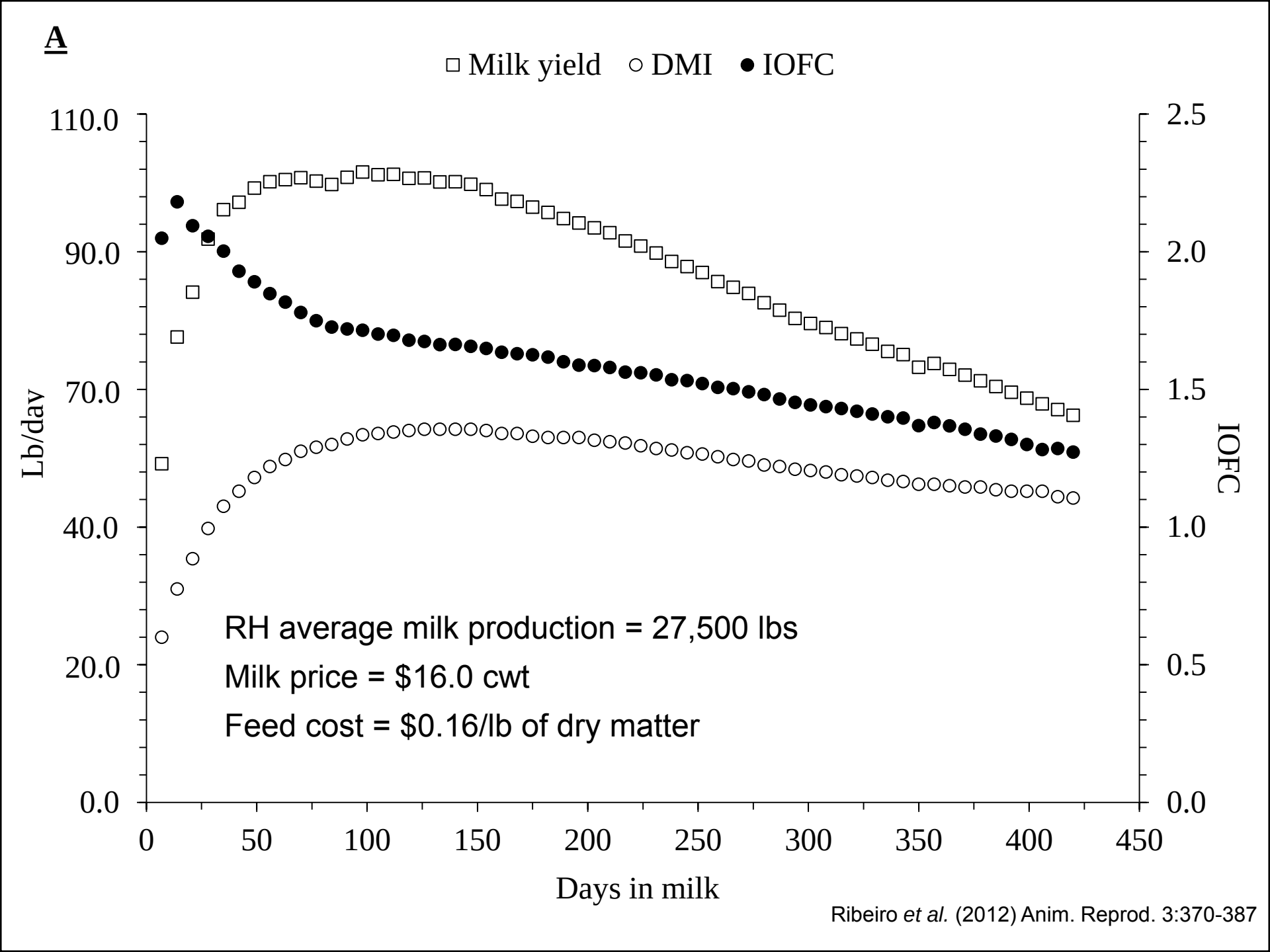
University of Florida

Illustration by Jeff Koterba

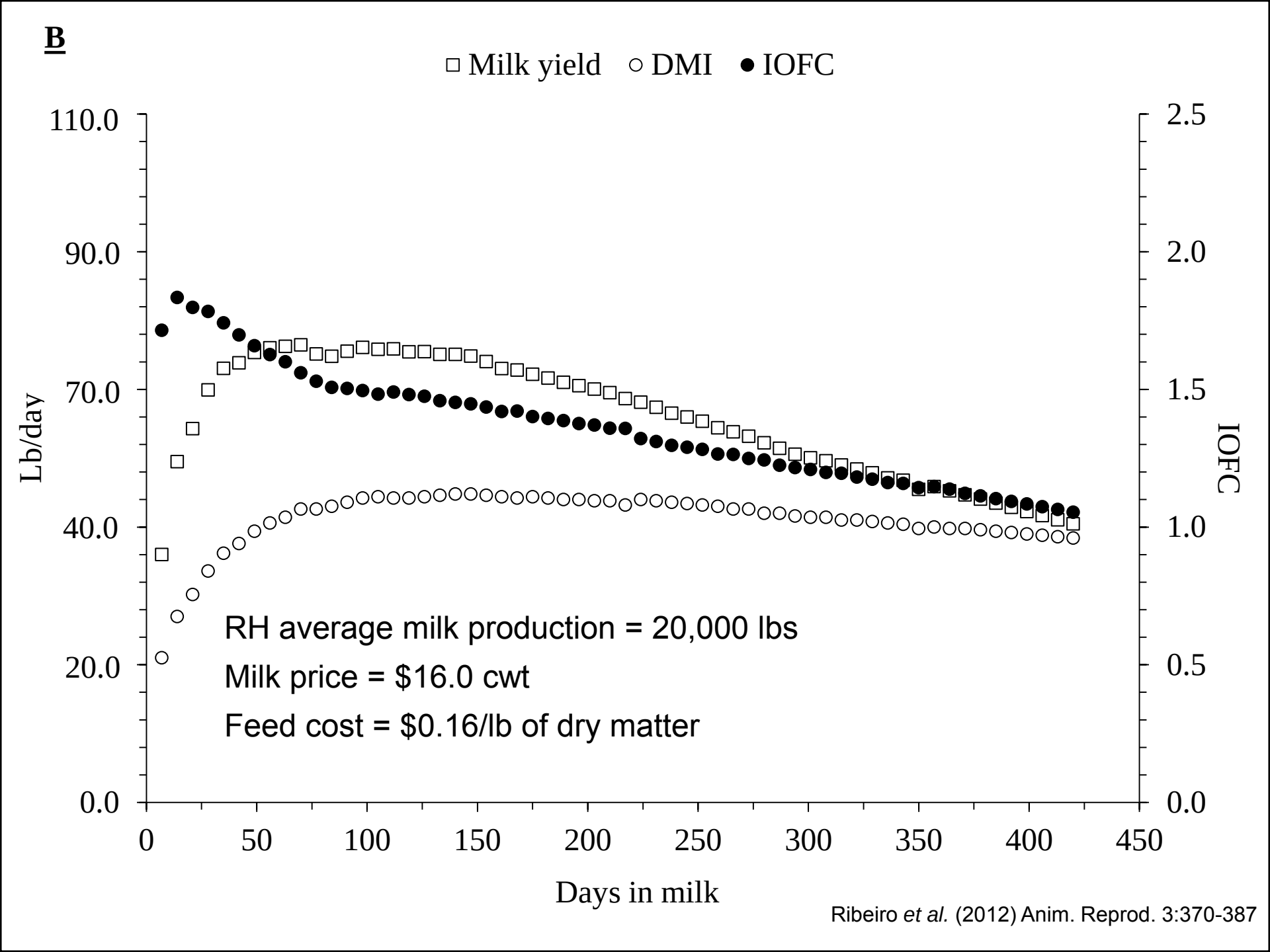
10-Year Milk Price and Feed Cost per cwt



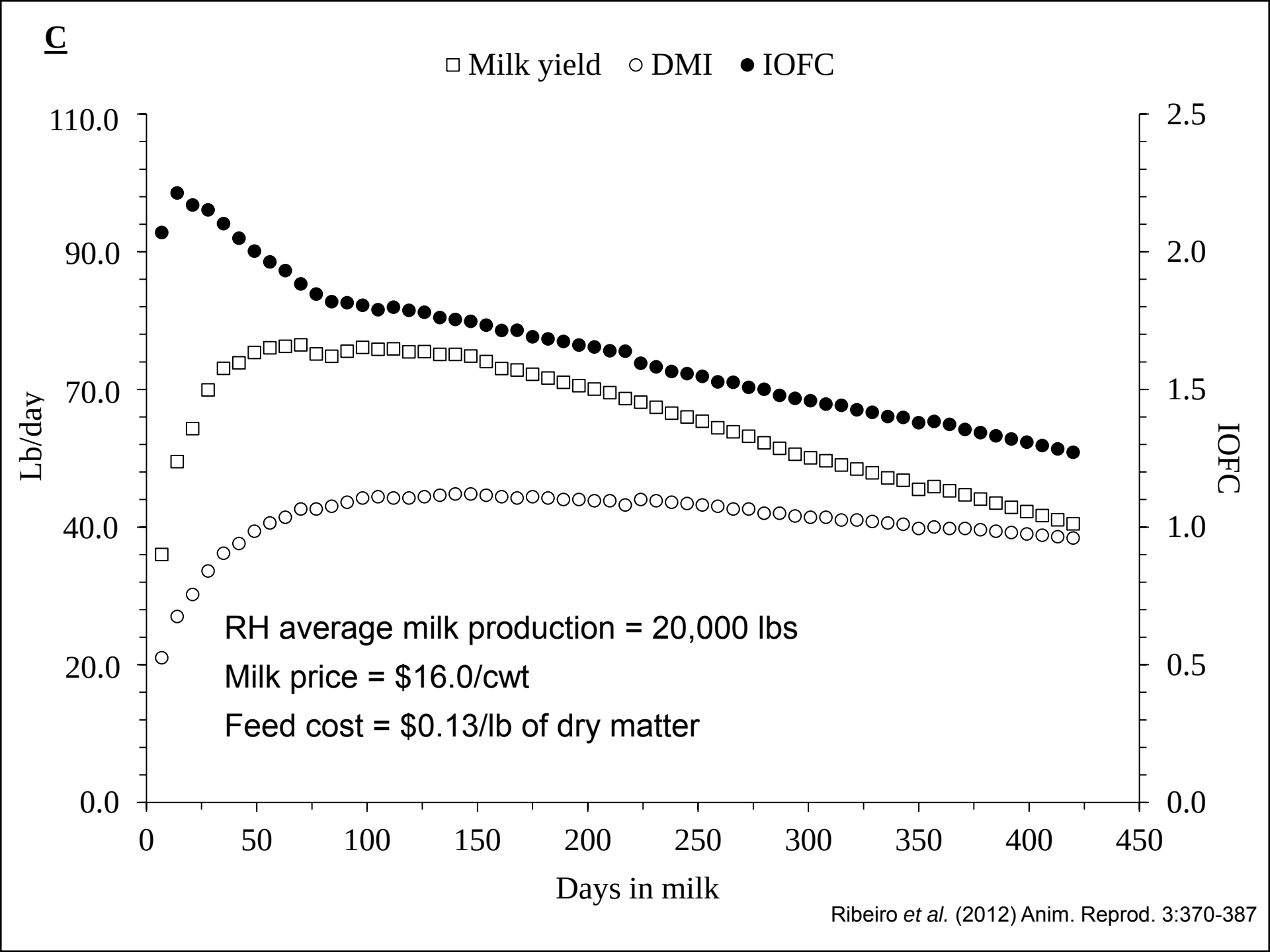
MPP = margin protection plan feed cost formula



Ribeiro *et al.* (2012) Anim. Reprod. 3:370-387



Ribeiro *et al.* (2012) Anim. Reprod. 3:370-387



Ribeiro *et al.* (2012) Anim. Reprod. 3:370-387

These are Some of the Many Areas that Need Attention

- Feeding management
- Forage quality
- Alternative feed sources

Feeding Management

Monitoring feed DM

Monitoring mixing and particle size

Frequent sampling

Proper use of mixer and trained workers

Stone et al. (2015) Proc. FL Ruminant Nutrition Symposium

How Much Feed Shrink Occurs in Dairy Farms

Forages	Herds	Range, %	Weighted Mean, %
Corn Silage (pile, pit)	15	4.8 – 16	9.1
Corn Silage (bag)	8	6.5 – 14	9.9
Haylage (pile, pit)	12	5.6 – 16	10.2
Haylage (bag)	11	8.5 – 17	10.7

Stone et al. (2015) Proc. FL Ruminant Nutrition Symposium

How Much Feed Shrink Occurs in Dairy Farms

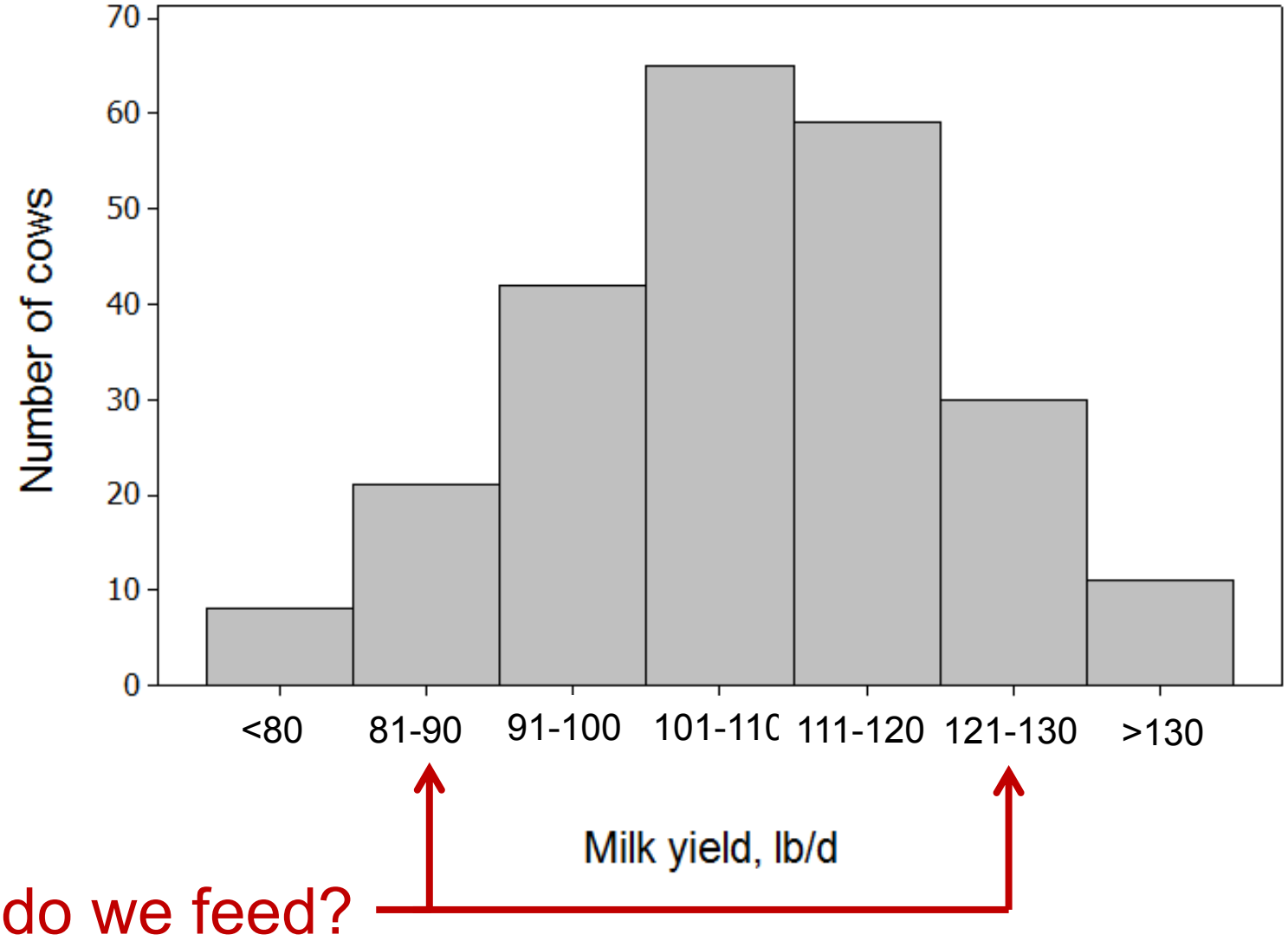
Other ingredients	Herds	Range, %	Weighted Mean, %
Feed Center (3 sided, open front)	16	2.5 – 11	6.7
Feed Center (under roof, enclosed)	5	2 – 7	4.0
Bulky Ingredients (CSH, WCS)	14	3.5 – 14	11.3
Upright/Overhead Storage	7	2 – 7	4.0
Wet Byproducts	13	12 – 40	23.0
Bagged Ingredients	16	2 – 19	8.1

Stone et al. (2015) Proc. FL Ruminant Nutrition Symposium

Avoidable Shrink is Expensive

Purchase cost = $200/ton of DM	
Shrink	**Cost of feed fed**
15%	$235/ton of DM
20%	$250/ton of DM
25%	$267/ton of DM
50%	$400/ton of DM

Herd Structure



Who do we feed?

Forage Quality

- Forage makes up 40 to 55% of most TMR fed to dairy cows
- Main source of dietary fiber for cows
  - ✓ Provides 60 to 75% of the dietary fiber
- Only 35 to 55% of the dietary fiber is digested by cows
  - ✓ Improved fiber digestion is expected to increase intake and production
- Corn silage contains up to 40% starch and can provide 40 to 60% of all dietary starch in the ration of dairy cows

The Case for High Quality Forage
BMR Corn Silage

Item	Normal	BMR
CP	8.4	8.2
NDF	44.7	43.8
Lignin	2.8	1.7
IVDMD, 30 h	73.8	78.0
IVNDF, 30 h	41.5	49.9

Allen et al. (1997) J. Dairy Sci. 80(Suppl. 1):157 (Abstr.)

Forage Quality and Fiber Level in the Diet

	Low NDF (29)		High NDF (35)	
	BMR	Control	BMR	Control
Corn silage	35.8	32.1	55.9	50.5
Alfalfa silage	8.1	7.7	12.6	12.2
Corn	26.2	29.2	0	5.6
Concentrate	29.9	31.0	28.4	31.7

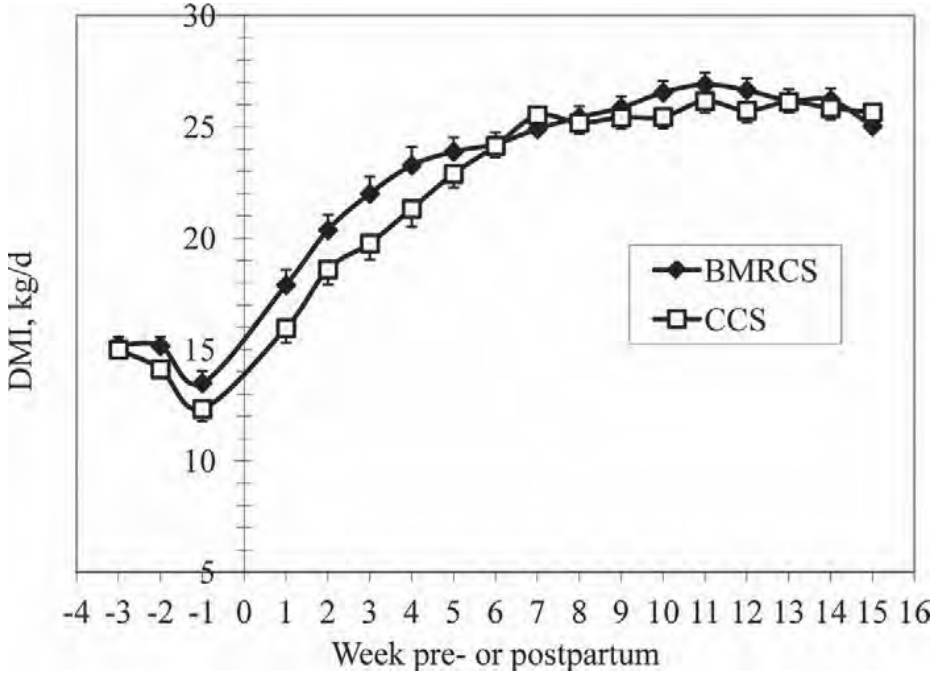
Oba and Allen (2000) J. Dairy Sci. 83:1333-1341

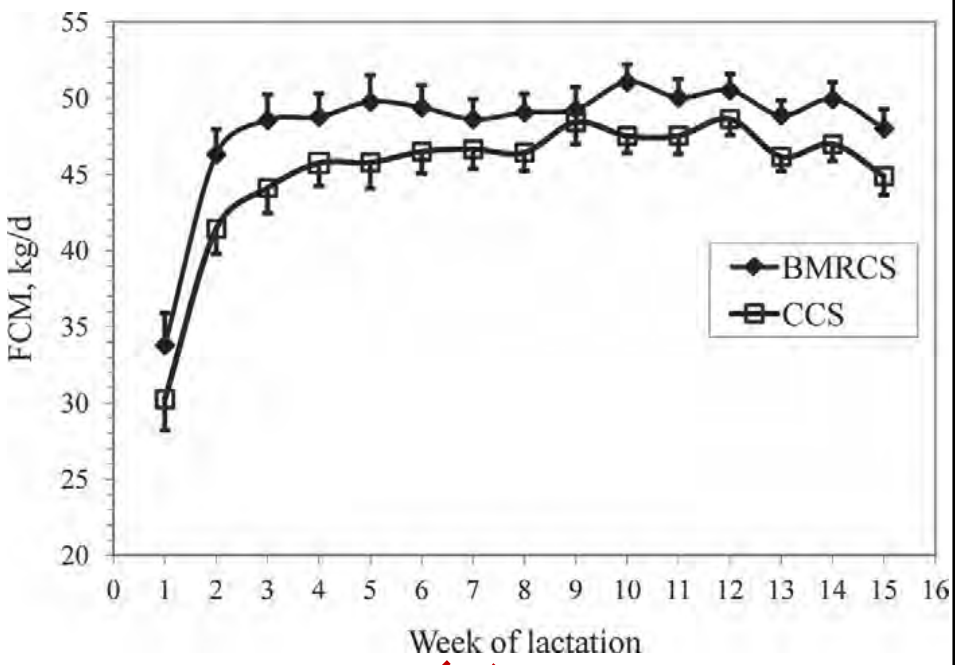
Forage Quality and Fiber Level in the Diet

Item	Low NDF		High NDF	
	BMR	Control	BMR	Control
DMI, lb/d	54.5	52.7	50.5	47.4
Milk, lb/d	81.4	73.9	74.3	67.0
Fat, %	3.28	3.67	3.86	3.90
Efficiency	1.49	1.40	1.47	1.41

Oba and Allen (2000) J. Dairy Sci. 83:1333-1341

Improved Forage Quality for Transition Cows





Wk 1 to 3	Wk 4 to 15	Wk 1 to 3	Wk 4 to 15
44.2 vs. 39.8	55.9 vs. 55.0	94.4 vs. 85.4	108.7 vs. 102.7

BMR vs. conventional corn silage fed from 3 wk before to 3wk after calving

Stone et al. (2012) J. Dairy Sci. 95 :6665–6676

Starch in Corn Silage – Hybrids Matter

- Corn hybrids vary in their ratio of forage to corn grain
- Hybrid 1 - 60%:40% (F:G)
  - ✓ 40% grain x 70% starch = 28% starch hybrid
- Hybrid 2 - 50%:50% (F:G)
  - ✓ 50% grain x 70% starch = 35% starch hybrid

Starch in Corn Silage Hybrids

- 40 to 50 hybrids grown every year in Gainesville for the forage testing
  - ✓ % starch ranges from 25% to 43%; average of 36%
- Some hybrids have more starch (42%) and digestible fiber with average DM yields

See forage report for details

Replace Some Corn With Corn Silage

- Corn silage is ~36% starch
- Feed MORE corn silage if inventory allows it.
- ⬆ corn silage by 2 lb =
- ⬇ in ground corn of 1 lb
- Ration savings = 3 to 5¢ / cow

Byproducts Partially Replacing Corn

Feed, % of diet DM	Cost, $/ton	Break-even cost to replace corn & SBM
Corn (24%)	230	- - -
Soybean meal (12%)	400	- - -
Gluten feed (10%)	210	$250
Soy hulls (15%)	150	$172
Citrus pulp (10%)	160	$185

Average DM intake of 55 lb/d and production at 85 lbs/d

Corn vs. Soybean Hulls

Measure	Corn	Soy hulls
Starch, %	71	1.6
Fat, %	4.4	3.1
Fiber, %	9.5	61.4
Net energy, Mcal/lb	0.95	0.66
Protein, %	9.5	14.2
Phosphorus, %	0.32	0.20

Soybean Hulls Partially Replaced Corn

Ingredient	4% SBH	13% SBH
Corn silage, %	33	33
Alfalfa silage, %	17	17
Ground corn, %	23	15
Soybean hulls, %	4	13
Starch, % of diet	*27*	*22*

Gencoglu et al., 2010

Soybean Hulls Partially Replacing Corn

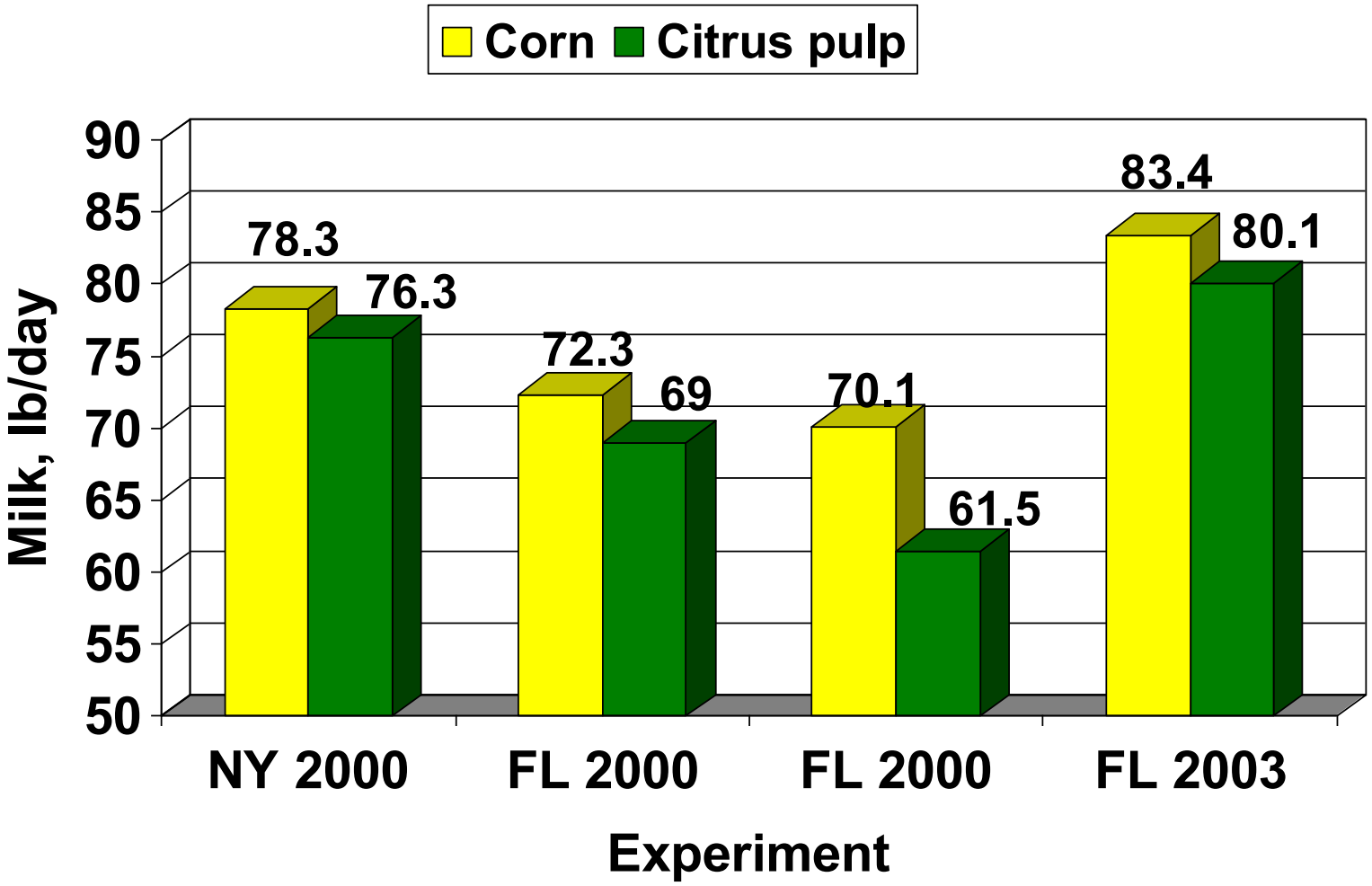
Measure	4% SBH	13% SBH
DM intake, lb/d	58.8[a]	64.1[b]
Milk, lb/d	109.8	112.2
Milk/DMI	1.91[a]	1.77[b]
Milk fat, %	3.08	3.33
Milk protein, %	3.07	2.99

You have to account for the lower feed efficiency

[a,b] Values with different letters are different

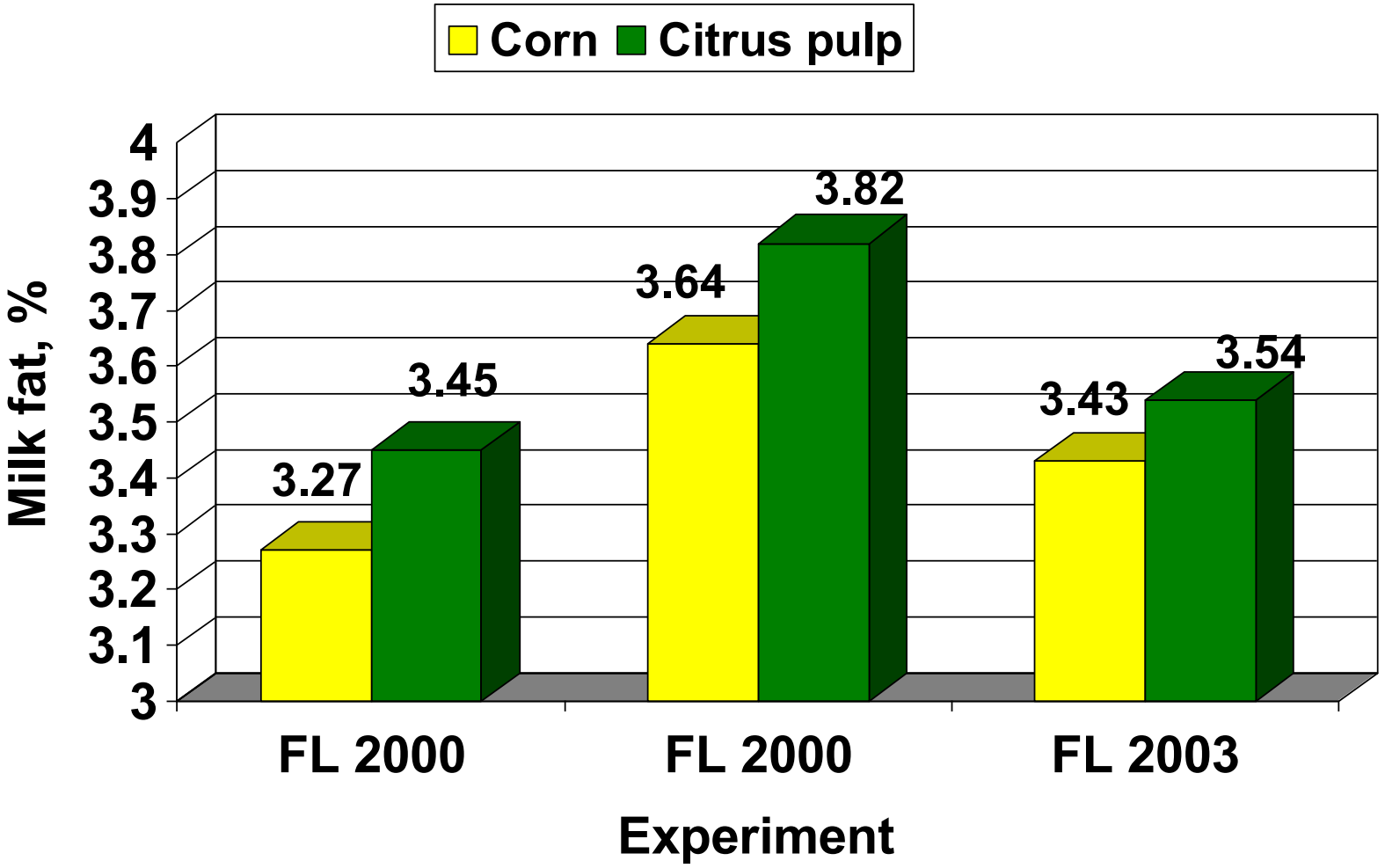
Gencoglu et al., 2010

Milk Response to Replacing Corn with Citrus Pulp



Corn or Citrus Pulp Fed at ~20% of Diet

Milk Fat Response to Replacing Corn or Hominy with Citrus Pulp



Corn or Citrus Pulp Fed at ~20% of Diet

Summary

- Control waste/shrink
  - ✓ Reduce the avoidable loss
- Pay attention to herd structure
  - ✓ Group cows accordingly
  - ✓ Feed 2, maybe 3 different rations to the lactating herd according to production potential and group structure
- Emphasize forage quality
  - ✓ Cost of production changes little if you have high compared with low corn silage quality
- Shop for ingredients
  - ✓ Consider ingredient cost, but also other hidden costs (changes in intake or production)