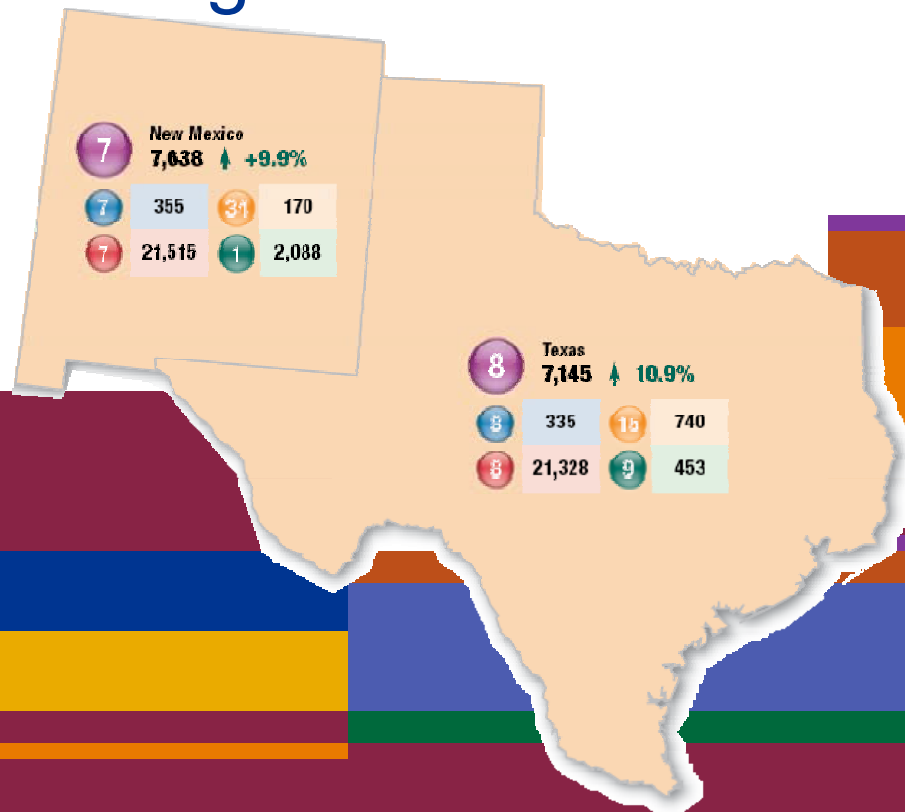


Trends on Dairy Economic Impacts in NM and TX and Consequent Decisions

Business Management Program

Clovis, April 11, 2006



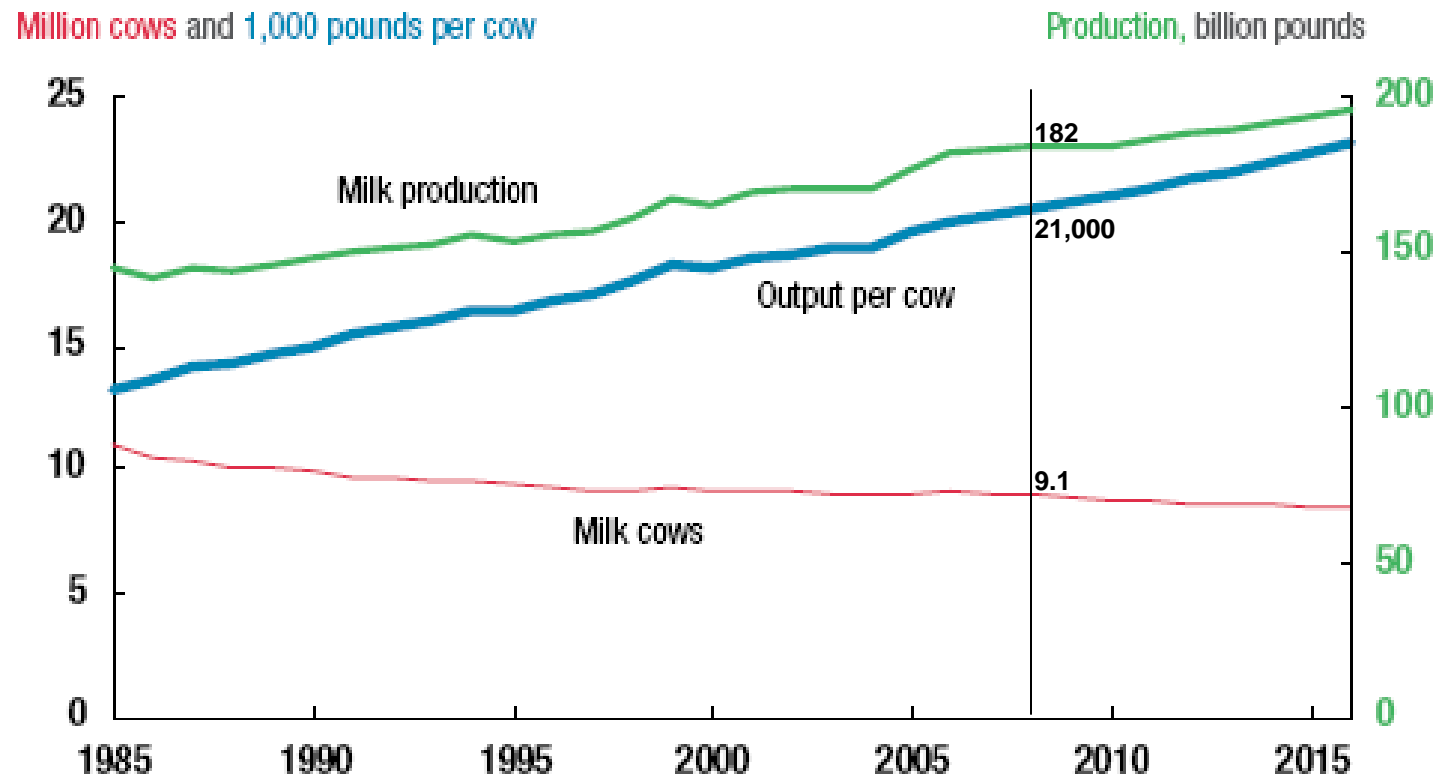
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New Mexico State University



USA Dairy Industry

U.S. milk production and dairy herd

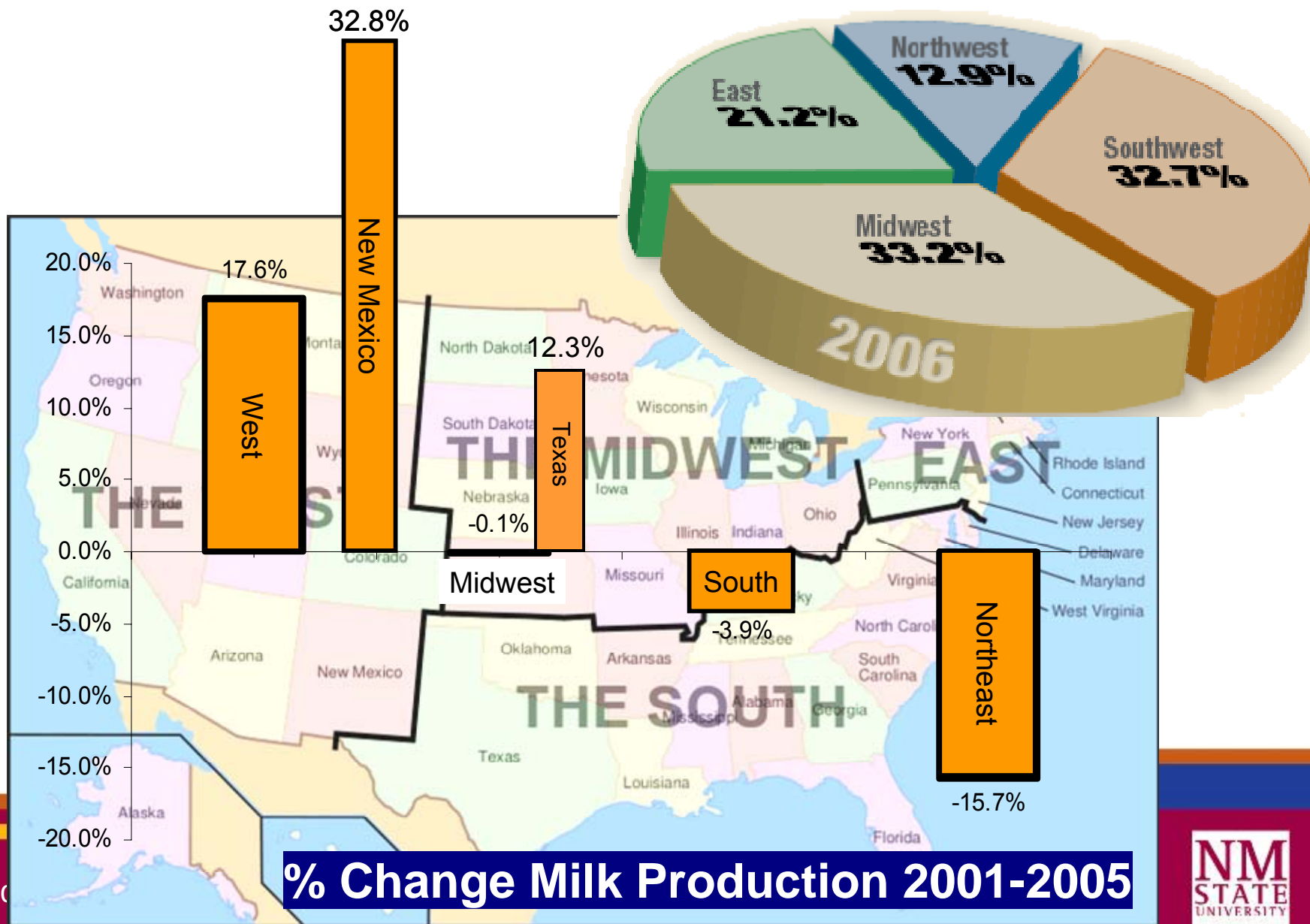


Source: USDA Long-term Projections, February 2007

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USA Dairy Industry



Vic

10-Year Growth

Top 15 Ranking –
Additional Milk Production
from 1996 to 2006
(millions of lbs of milk)

(50.2%)	California	12,982
	Idaho	6,160
(103.5%)	New Mexico	3,885
	Michigan	1,670
	Arizona	1,480
	Kansas	1,143
	Indiana	1,133
(16.7%)	Texas	1,025
	Wisconsin	1,022
	Colorado	914
	Oregon	634
	New York	535
	Ohio	500
	Iowa	346
	Pennsylvania	258

3-Year Growth

Top 15 Ranking–
Additional Milk Production
from 2003 to 2006
(millions of lbs of milk)

California	(9.6%)	3,393
Idaho		2,121
Texas	(26.9%)	1,515
Wisconsin		1,132
New Mexico	(14.6%)	972
Michigan		725
Pennsylvania		404
Arizona		402
Colorado		394
Ohio		370
Indiana		360
Iowa		320
Kansas		213
South Dakota		175
Utah		123

1-Year Growth

Top 15 Ranking –
Additional Milk Production
from 2005 to 2006
(millions of lbs of milk)

California	1,266	(3.4%)
Idaho	734	
Texas	703	(10.9%)
New Mexico	687	(9.9%)
Wisconsin	532	
Michigan	350	
Pennsylvania	239	
Arizona	212	
Colorado	199	
Minnesota	169	
Indiana	133	
Ohio	117	
Iowa	105	
Utah	84	
South Dakota	68	

New Mexico Dairy Industry



1st in herd size

4.2% of the US milk

**3rd productivity
amongst the highest**

3rd growth rate

7th milk production

7th number cows

Texas Dairy Industry



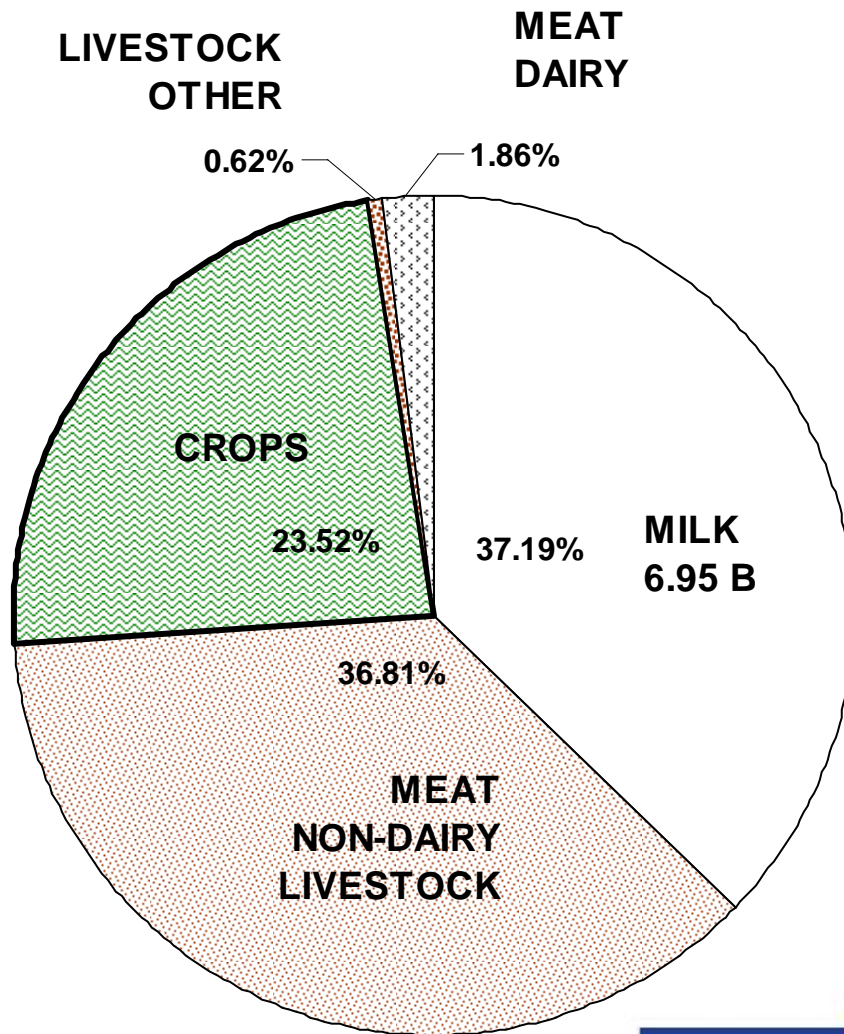
3.9 % of the US milk
4th productivity
amongst the highest

3rd growth rate
(1-3 yr)

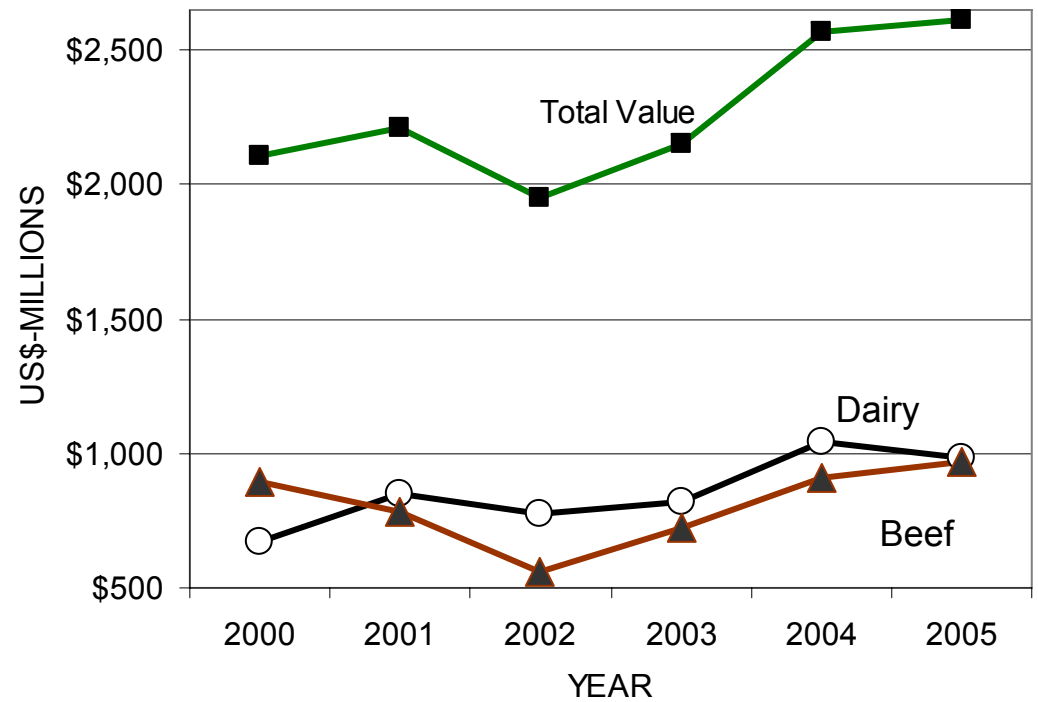
8th Milk production

8th number cows

NM Dairy Industry



1st Agricultural Industry

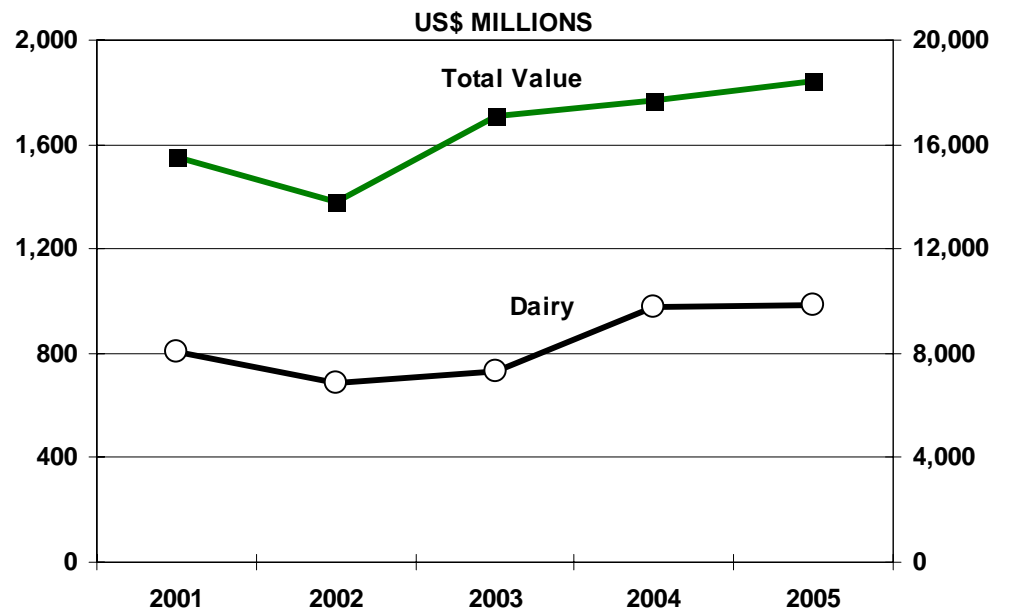
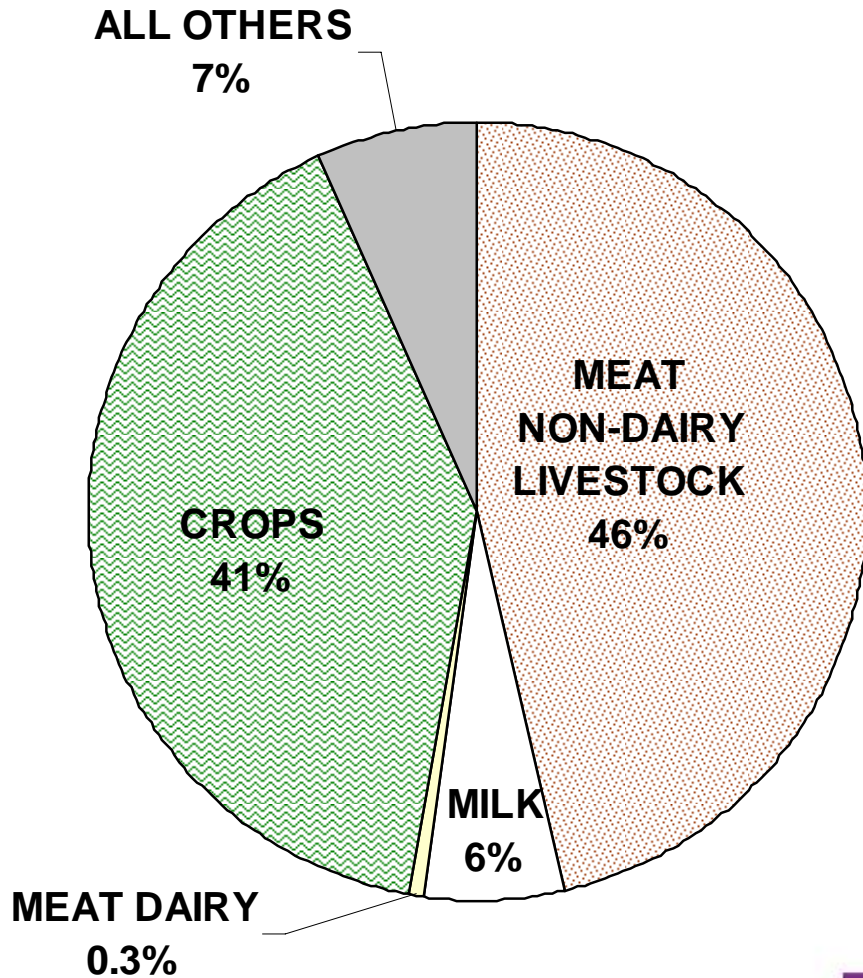


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TX Dairy Industry

5th Agricultural Industry

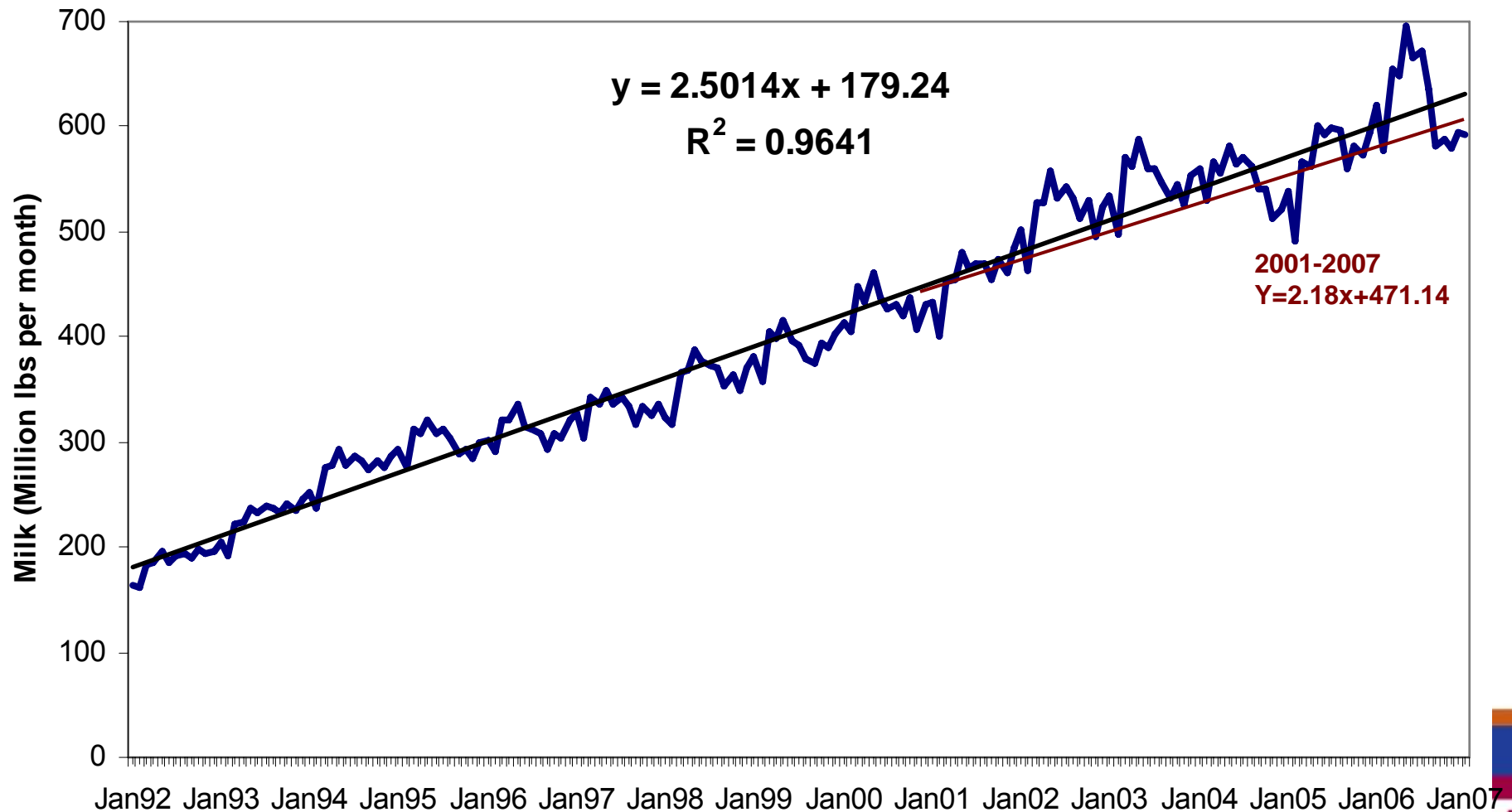


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NM Dairy Industry Growth

Monthly milk production (1992-2007)

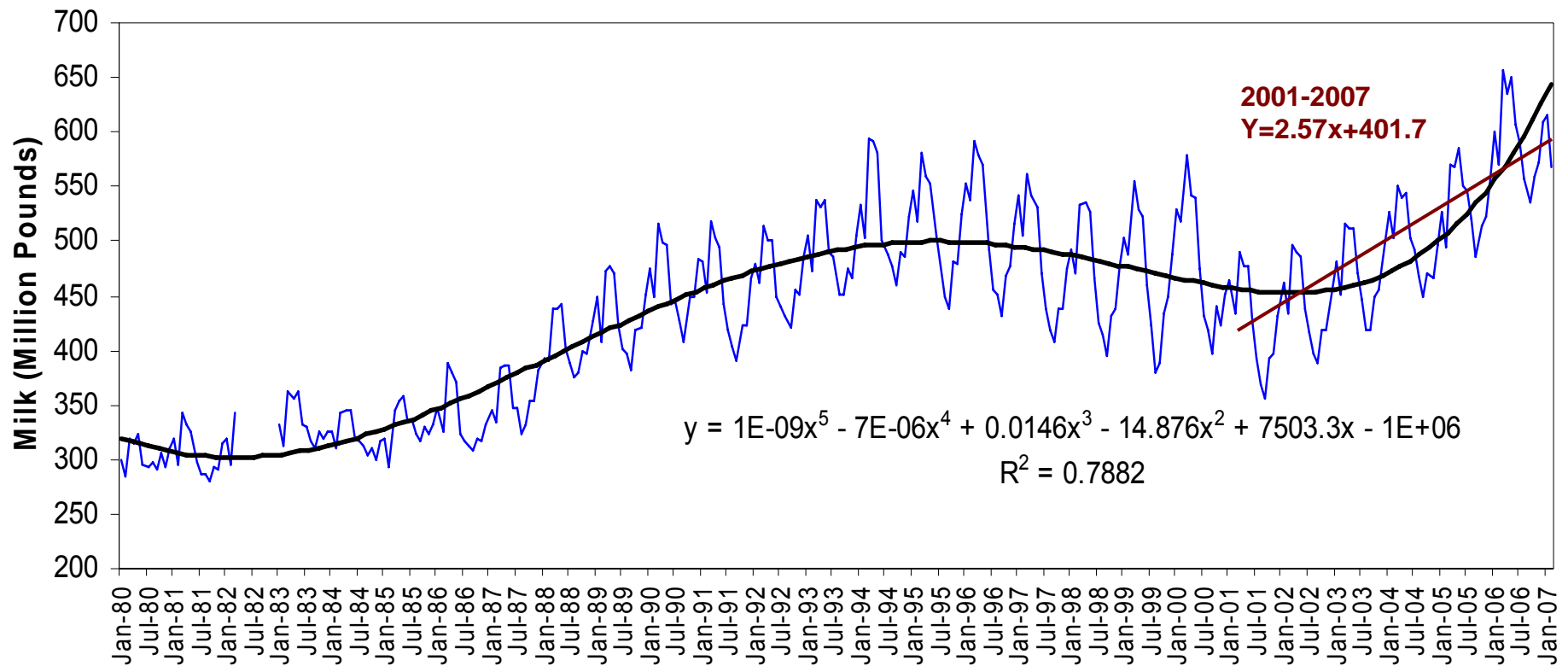


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TX Dairy Industry Growth

Monthly milk production (1992-2007)

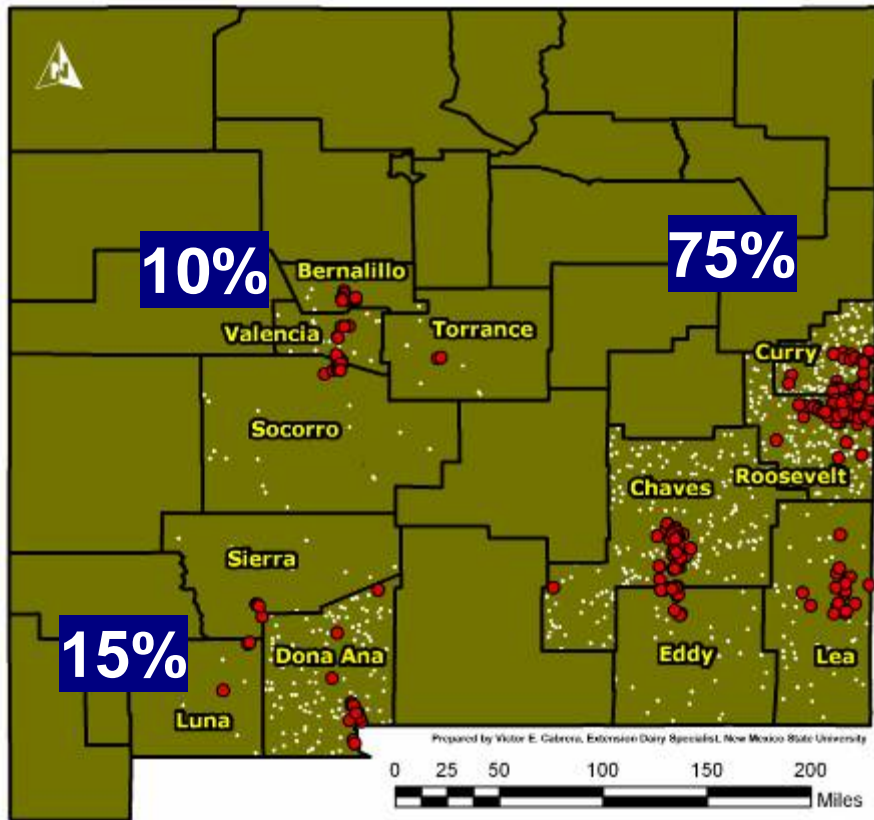


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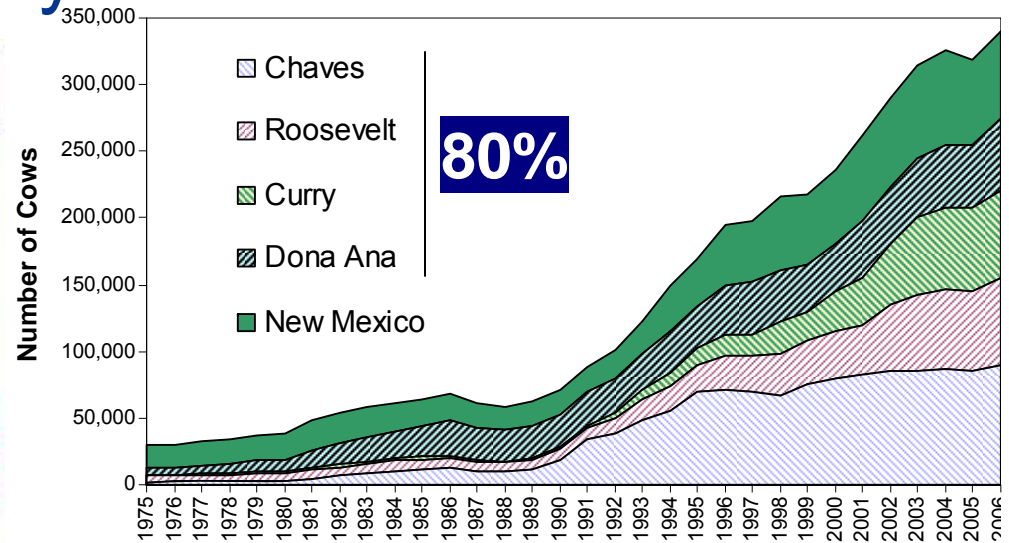


NM Dairy Industry Location

Concentration of dairy farms and milk in NM



● Dairies ■ Milk production



2005 = 6,860,396,990 lbs milk

County	Producers	Milk Cows	Milk Production
	(#)	(#)	%
Chaves	43	90,000	27.13
Roosevelt	43	65,000	18.69
Curry	26	66,000	18.29
Doña Ana	26	53,000	15.75
Lea	14	25,000	6.93
Eddy	6	19,000	4.21
Valencia	9	4,000	2.68
Socorro	8	11,000	2.24
Bernalillo	4	2,000	0.89
Other*	8	5,000	3.18
New Mexico	187	340,000	100

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Dairy Industry Location

Milk processing plants



4 Fluid

5 Cheese

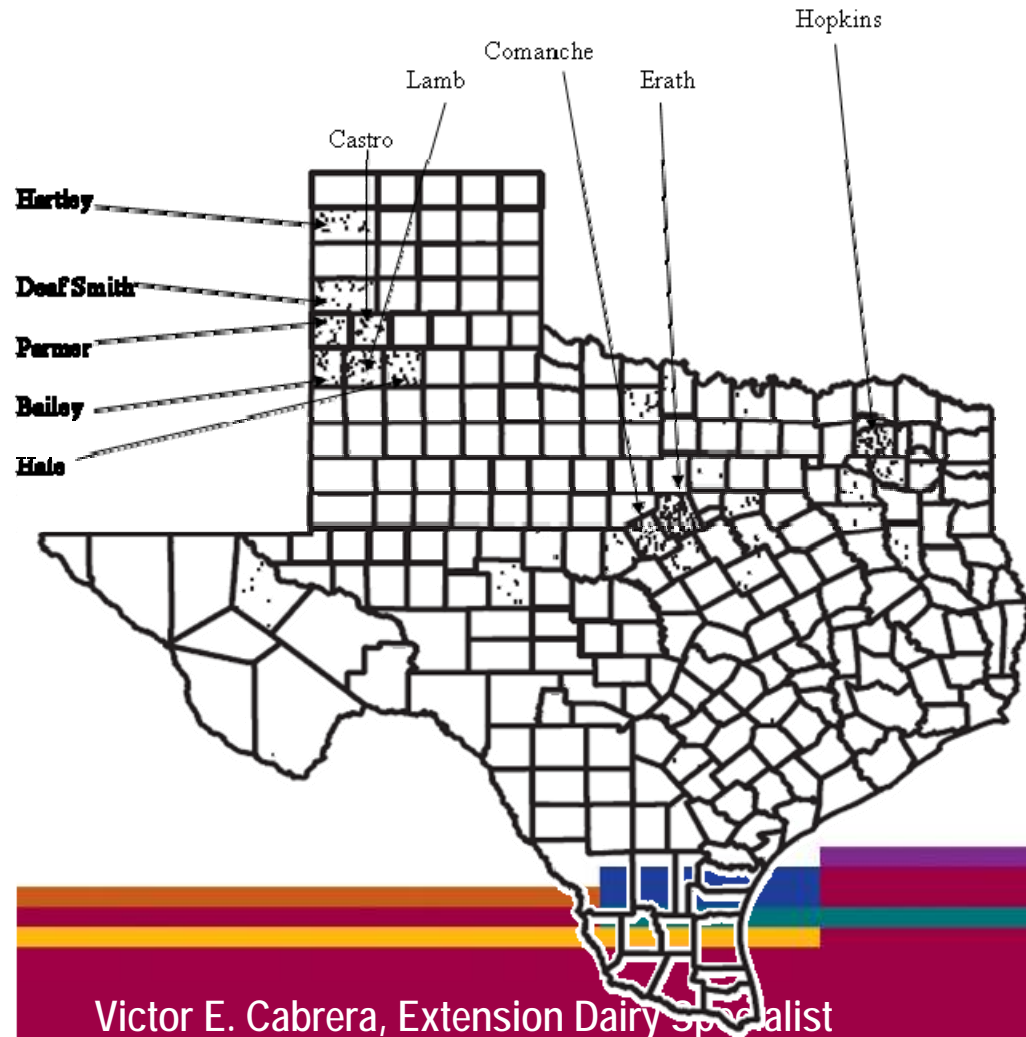
4 Powder

1 Ice Cream

1 Ultra Filtration

TX Dairy Industry Location

Concentration of dairy farms and milk in TX



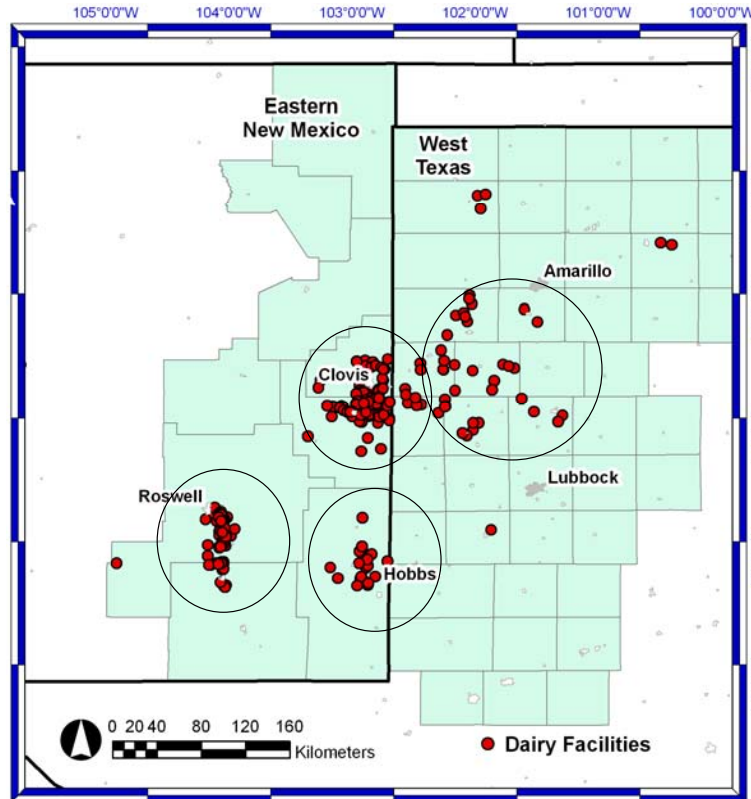
		Milking cows heads	Milk (000) pounds	Milk Productivity Pounds/cow/year
1	Erath	62,004	1,225,200	19,760
2	Hopkins	27,193	538,700	19,810
3	Comanche	25,003	496,300	19,850
4	Lamb	19,199	385,900	20,100
5	Castro	17,300	346,000	20,000
6	Hale	16,100	321,200	19,950
7	Deaf Smith	12,798	254,300	19,870
8	Bailey	11,801	237,200	20,100
9	Parmer	11,801	235,200	19,930
10	Hartley	10,598	212,700	20,070
	Others ¹	111,200	2,189,300	19,559

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Eastern NM – West TX Dairy Industry

Concentration of dairy farms and milk in SHP



2,300 cows/operation

400 K Cows

174 producers

8 billion lbs

4.4% USA milk

75% NM milk

47% TX milk

NM Dairy Industry Impact

Direct Revenue and Labor

Dairy Products	(\$ 000,000)	FTE (#)
Dairy Production Milk Processing		4,221*
Fluid milk manufacturing	980	1,539
Ice cream manufacturing	389	718
Cheese manufacturing	131	182
Creamery butter manufacturing	196	272
Meat animals	264	367
	49	122
Total	1,029	5,882

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NM Dairy Industry Impact

Indirect Allied Industries

Selected Sector	Output (000,000 \$)	Value Added (000,000 \$)	Employment (FTE)
1 Cattle and ranching farming	645	106	5,060
2 Milk processing	182	17	272
3 All Other Crop Farming	97	51	470
4 Wholesale Trade	63	43	546
5 Real Estate	37	26	364
6 Petroleum Refineries	36	1	7
7 Oil and Gas Extraction	29	16	83
8 Agriculture and Forestry Support Activities	26	15	926
9 Truck Transportation	19	8	167
10 Power Generation and Supply	16	11	36
11 Management of Companies and Enterprises	14	8	107
12 All Other Miscellaneous Professional	14	6	28
Other 350 NM industries	196	95	2088

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NM Dairy Industry Impact

Induced Allied Industries

Selected Sector	Output (000,000 \$)	Value Added (000,000 \$)	Employment (FTE)
Owner Occupied Dwellings	34	28	-
Food Services and Drinking Places	15	7	344
Real Estate	13	9	125
Offices of Physicians, Dentists, and Others	12	8	138
Wholesale Trade	10	7	91
Hospitals	10	5	103
Monetary Authorities and Depositories	6	5	39
Motor Vehicles and Parts Dealers	6	4	15
Petroleum Refineries	6	1	1
Power Generation and Supply	5	4	12
Dairy Industry	23	146	18
Other 352 industries	137	68	1,930

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NM Dairy Industry Impact

Overall Impacts as proportion of NM

	Total Output (\$000,000)	Agriculture % of Total	Dairy % of Total	Total Employment (FTE)	Agriculture % of Total	Dairy % of Total
Chaves	3,202	28.83	21.64	29,030	16.95	12.84
Roosevelt	1,053	37.61	30.48	9,367	20.04	15.04
Curry	2,154	21.36	16.11	23,256	8.72	7.03
Dona Ana	6,779	8.16	6.11	86,629	7.65	3.19
Lea	3,507	26.20	3.22	29,864	3.63	2.32
New Mexico	99,030	7.94	2.67	1,041,035	4.88	1.65

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NM Dairy Industry Impact

Overall Impacts

	Direct	Indirect	Induced	Total
Output (000,000 \$)	1,015	1,364	254	2,633
Employment (FTE)	4,221	10,130	2,798	17,149
Value Added (000,000 \$)	97	402	146	645

	Direct	Indirect Type I Multipliers	Induced	Total Type SAM Multipliers
Output	1.000000	1.353166	0.250488	2.603655
Labor Income	0.075480	0.235025	0.075851	0.386356
Employment (FTE)/\$Million	4.156403	9.974973	2.755180	16.886556

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Dairy Industry Impact

Impact of a NM dairy farm



2,000 Cows

42 M lbs milk/year

\$6.4 M direct impact

\$16.6 M total impact

26.6 direct jobs

108 total jobs

Dairy Industry Impact

Impact of a NM dairy cow



21,515 lbs milk/year

\$2,750 direct impact

\$7,160 total impact

0.03 direct jobs

0.12 total jobs

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TX Dairy Industry Impact

Overall Impacts

	Direct	Indirect	Induced	Total
Output (000,000 \$)	1,020	1,218	256	2,494
Employment (FTE)	3927	11,313	2,244	17,484
Value Added (000,000 \$)	114	412	150	676

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SHP Dairy Industry Impact

Overall Impacts

	Direct	Indirect	Induced	Total
Output (000,000 \$)	1,100	1,328	230	2,660
Employment (FTE)	4,690	8733	2496	15,919
Value Added (000,000 \$)	116	395	133	644

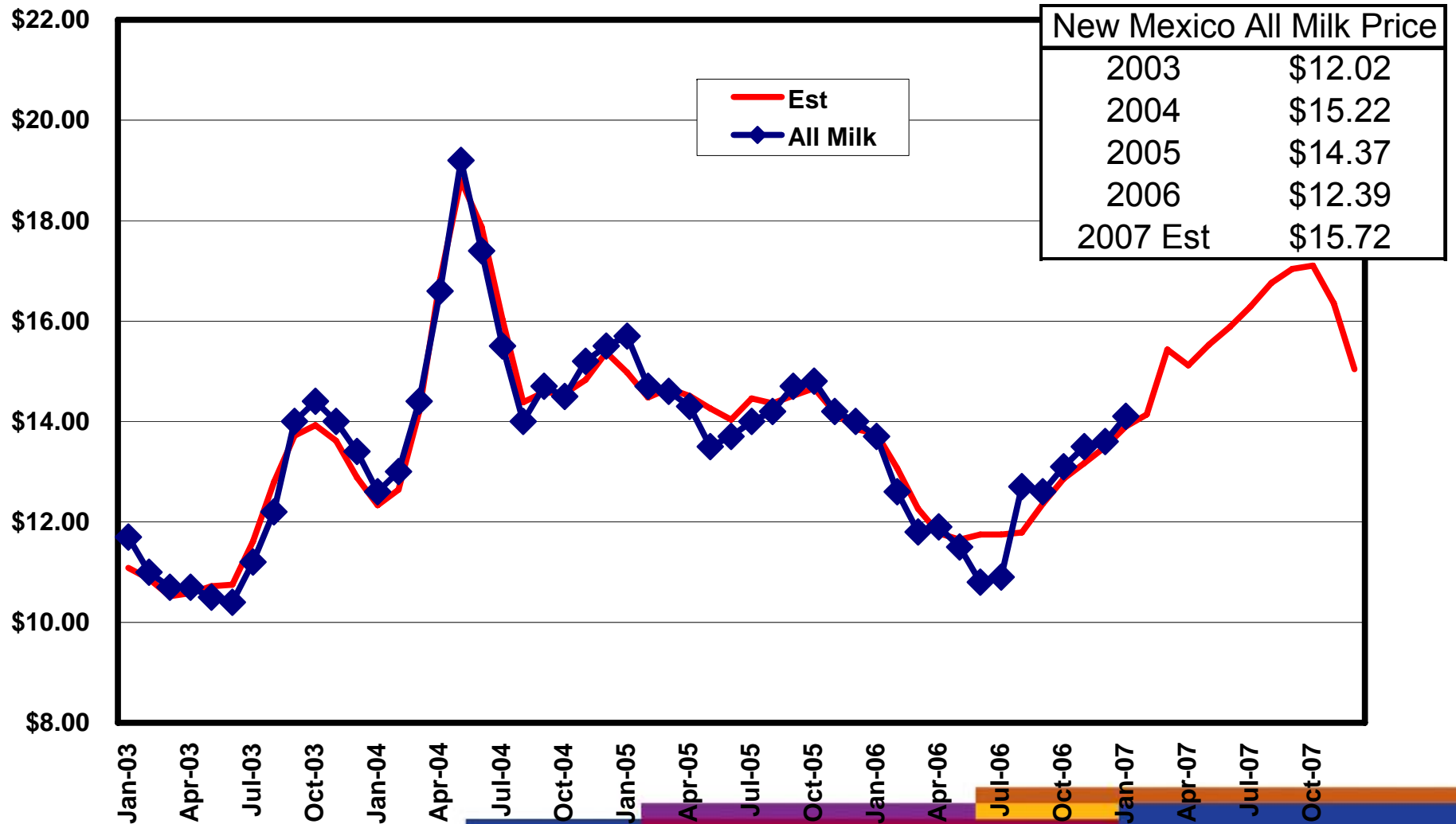
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All this enormous impact is GREAT,
but...

- Economic Competence
 - Milk prices
 - Labor
 - Feed costs
 - Land costs
- Environmental issues
 - Permit acquiring or renewal
 - Activist groups

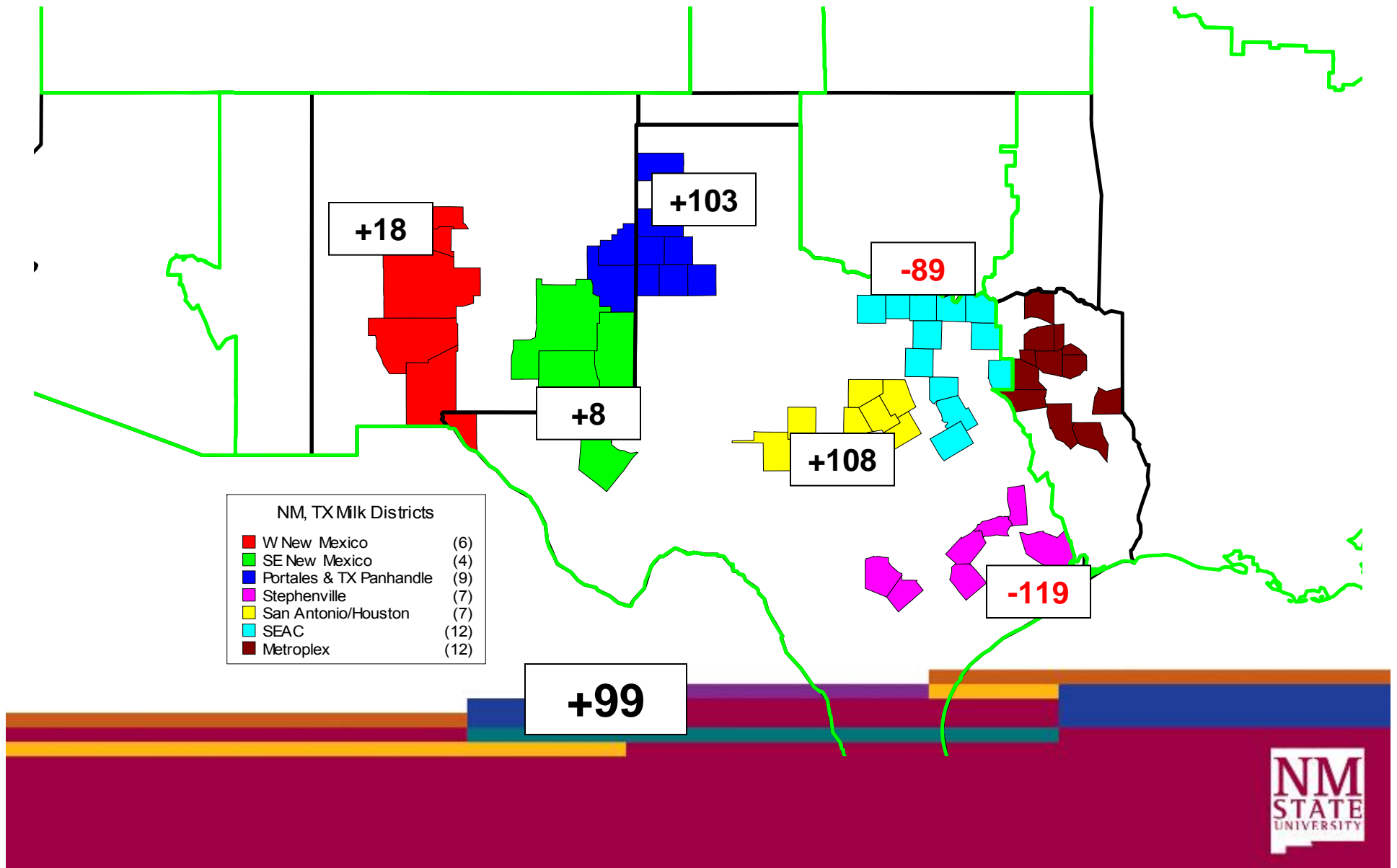
NM Milk Prices. DFA: Too much milk



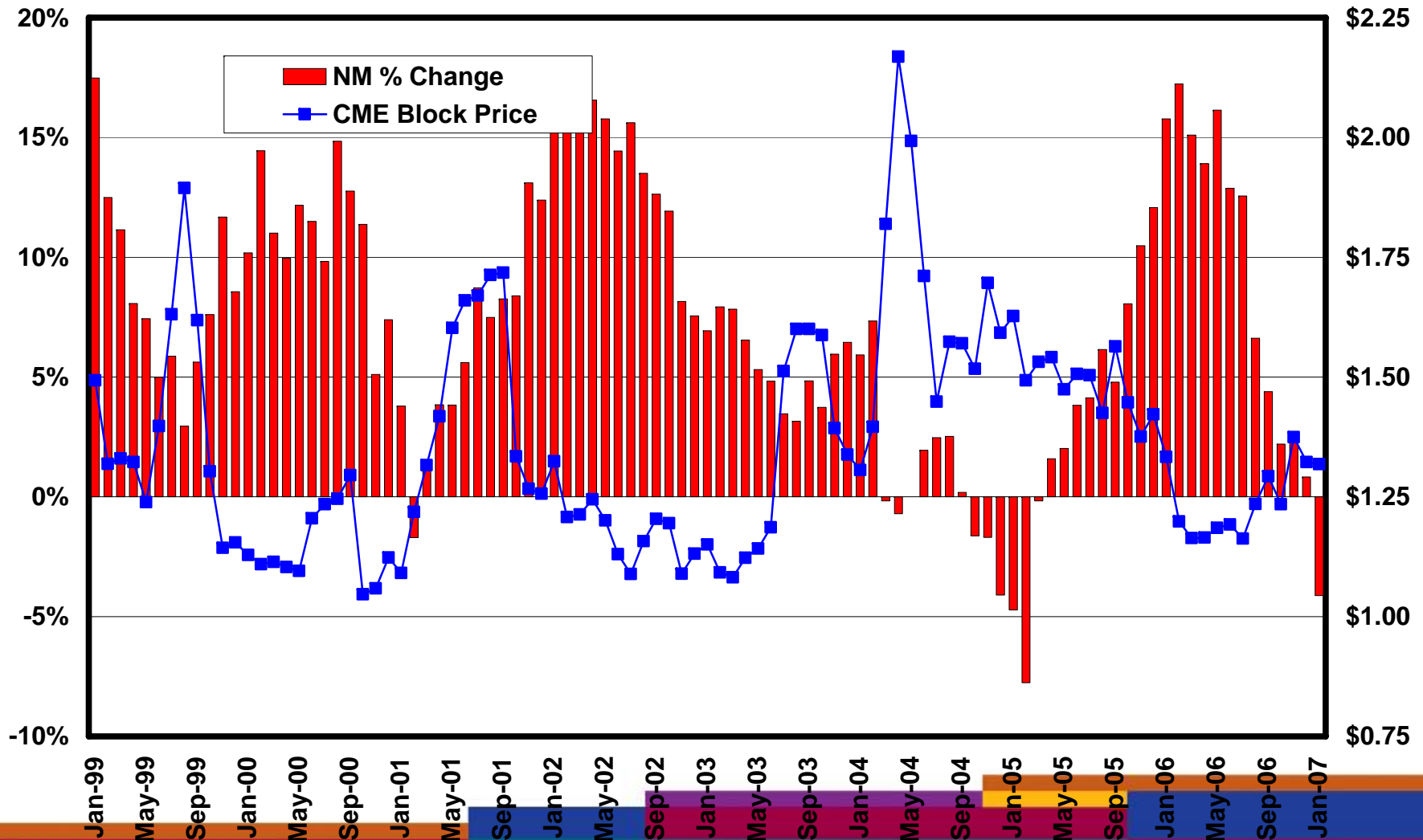
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NM Milk Balance by Districts (loads)



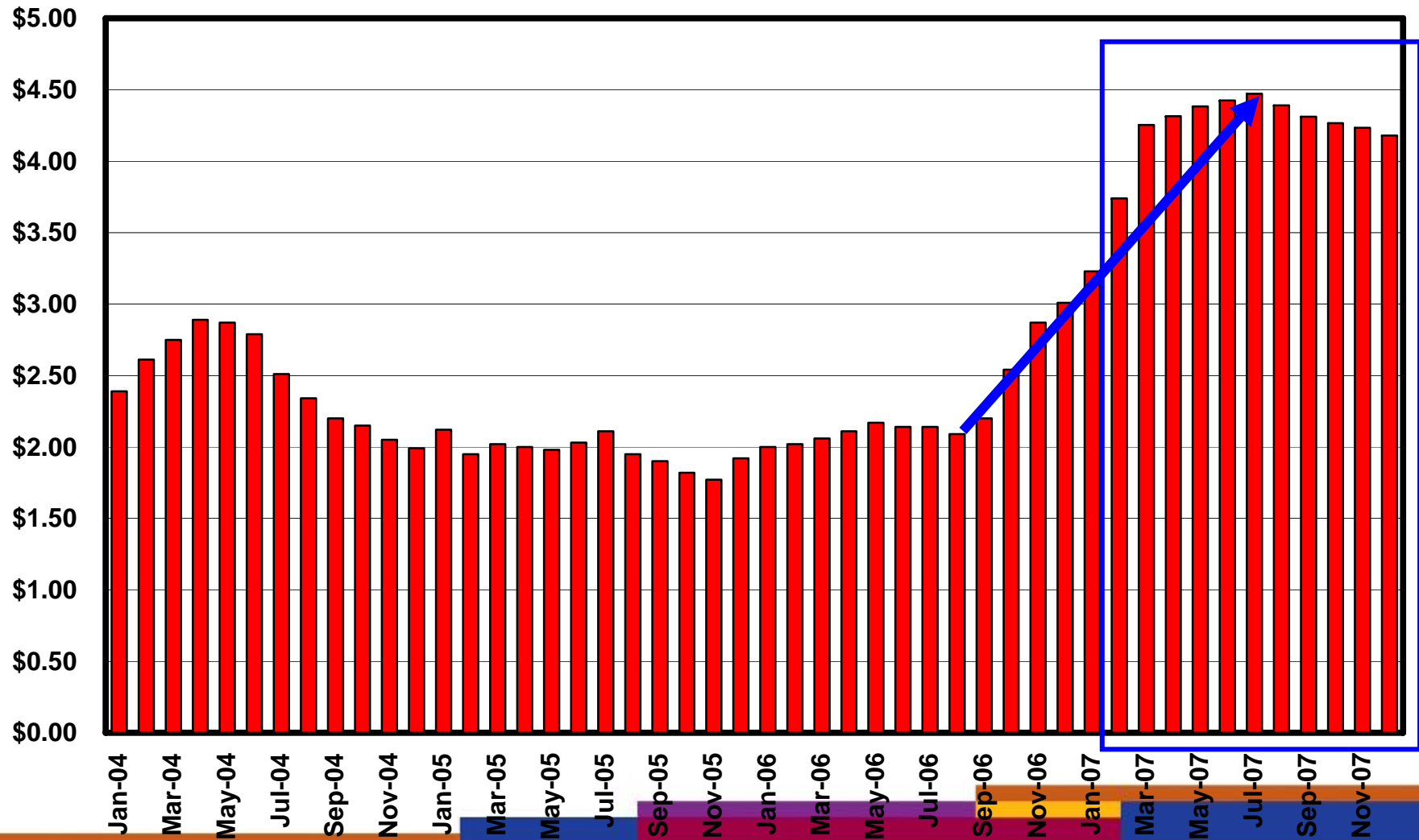
NM Milk Production and CME Cheese



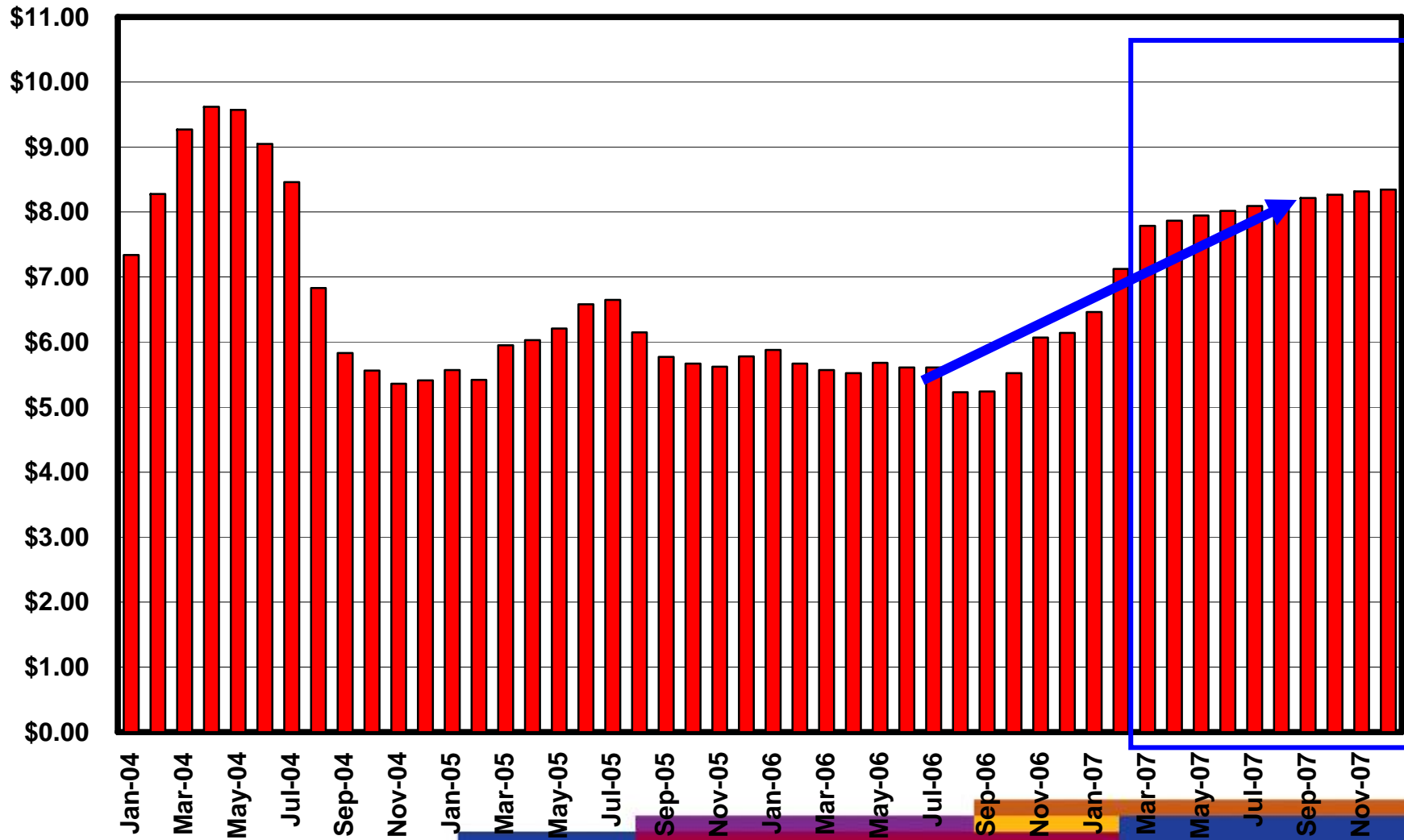
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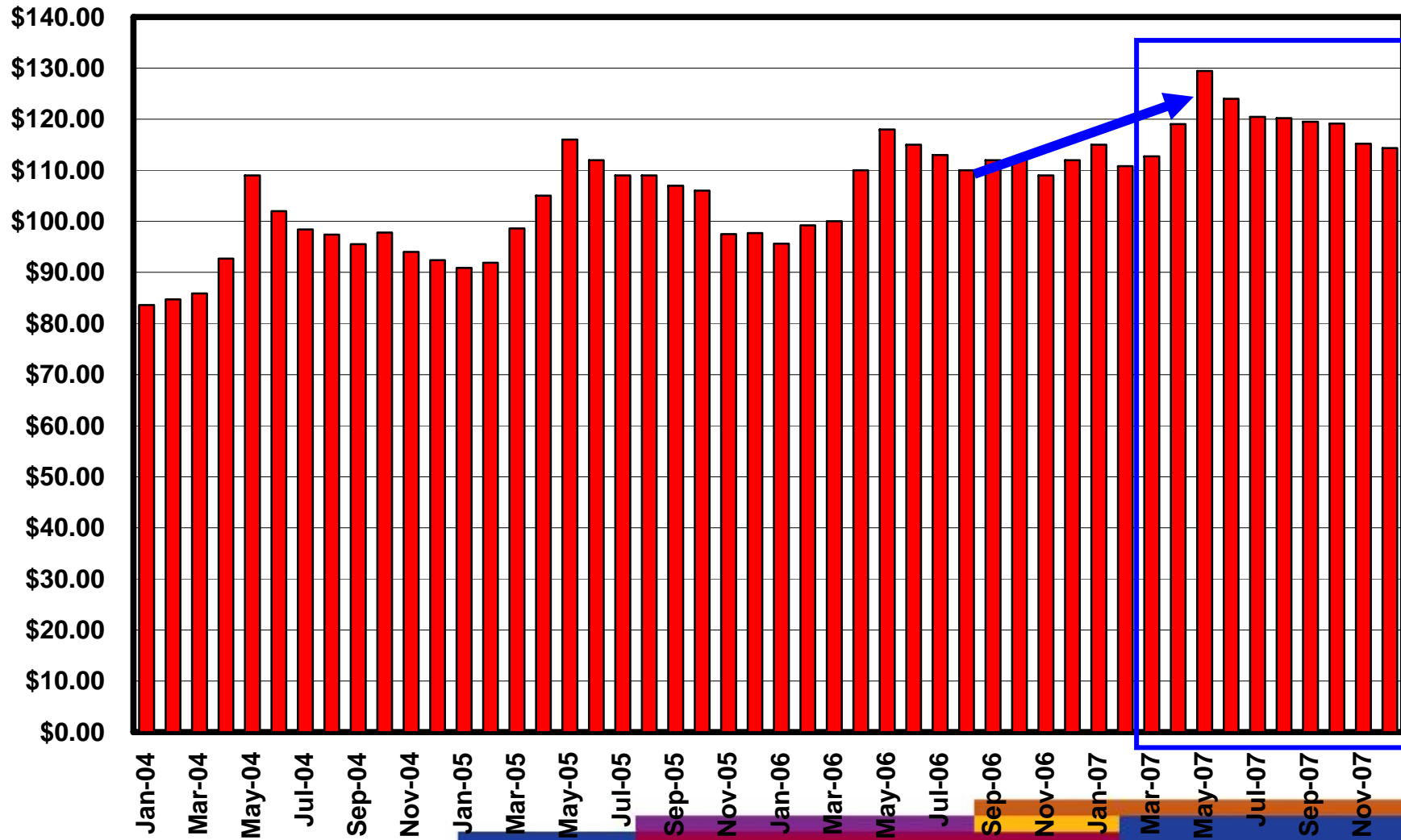
US Average Corn Price



US Average Soybean Price



US Average Alfalfa Price



All this enormous impact is GREAT,
but...

- Economic Competence
 - Milk prices
 - Labor
 - Feed costs
 - Land costs
- Environmental issues
 - Permit acquiring or renewal
 - Activist groups

Bottom Line

We are all dealing with:

RISK

What is RISK

- Risk: Known probability of outcome
 - (10% chance of rain)
- Uncertainty: Unknown probability of outcome
 - (it may rain tomorrow)
- Risk: Perfect knowledge of all outcomes
- Uncertainty: Imperfect knowledge
- Risk: Uncertain consequences
 - (some possible outcomes you may not like)

Sources for Risk on a Dairy Farm

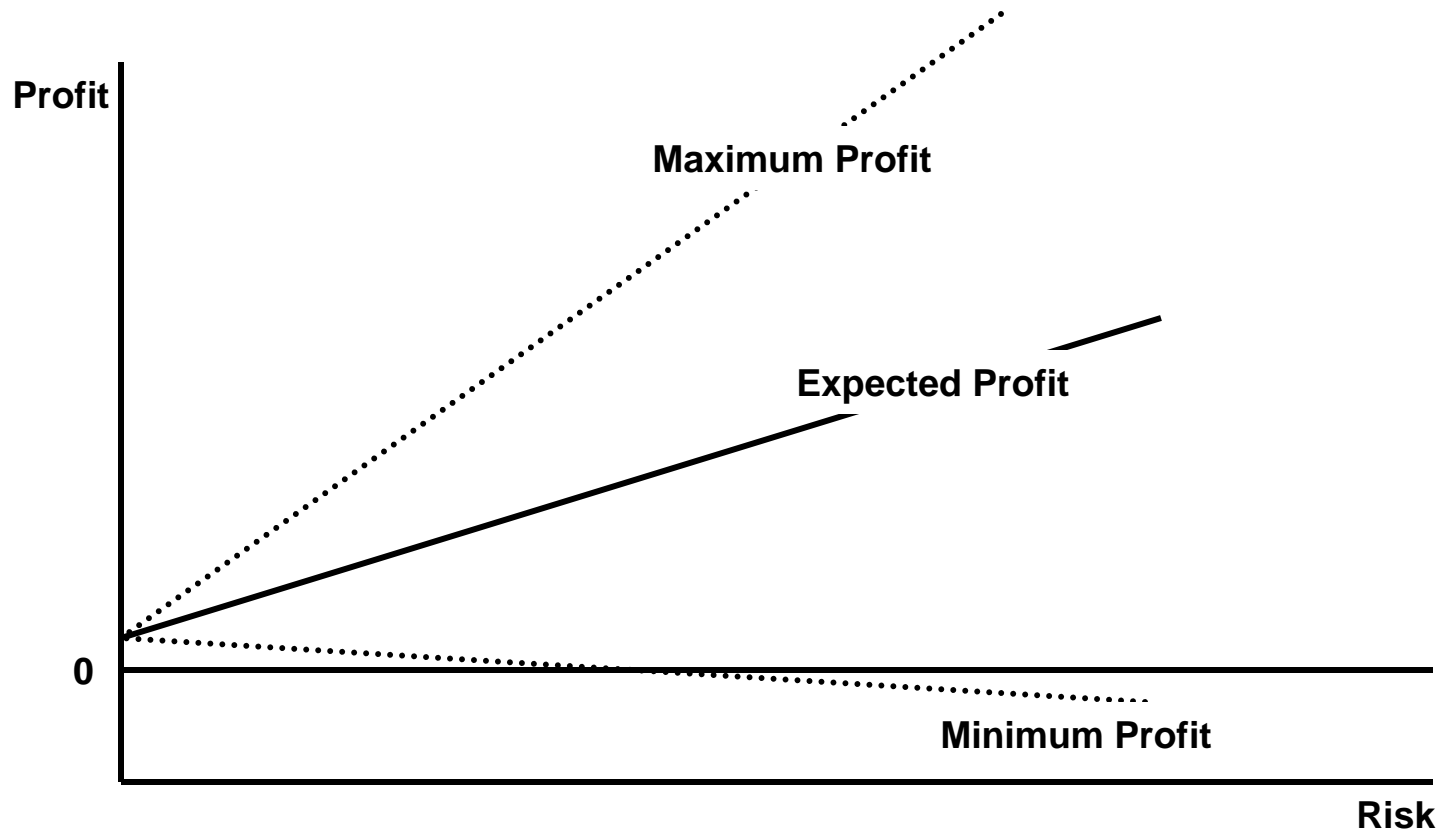
- Production Risk (weather, climate, disease)
- Price Risk (market, variation of price)
- Casualty Risk (fire, injury)
- Human Risk (theft, resignation of employees)
- Political Risk (environmental regulations)
- Obsolescence Risk (before depreciated)

Business Risk= variations in returns over time

Financial Risk= amount of debt compared to equity

What is Profit

Reward for taking a risk. Usually \uparrow Risk \uparrow Profit



How Much Risk I Should Take?

Coin Game: Tails → \$5, Heads → \$0

Expected Return (ER):

$$\$5 \times 0.5 + \$0 \times 0.5 = \$2.5$$

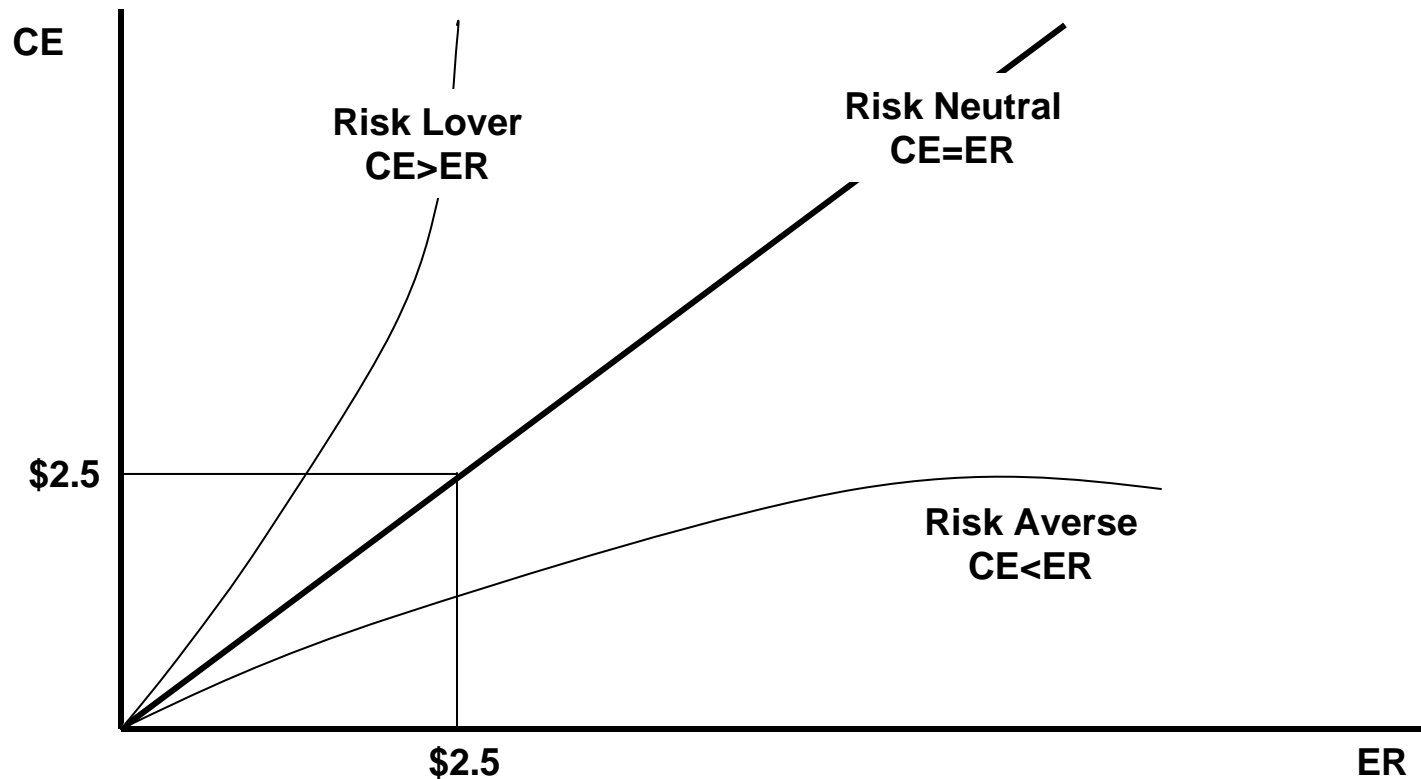
How much would you bet?:

\$0.5, \$1, \$2.5, \$3, \$4, \$5

Certainty Equivalents (CE)

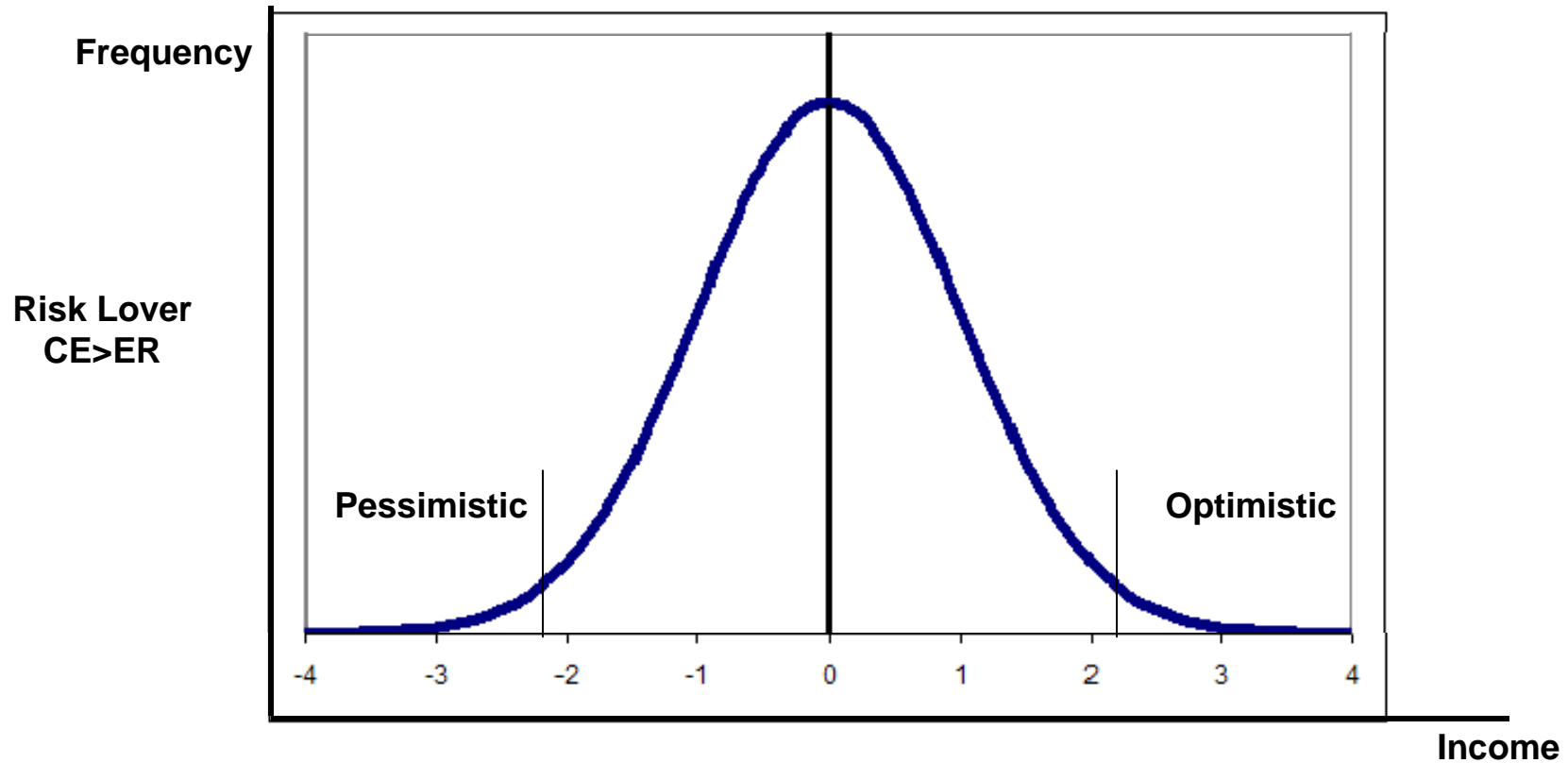


Depends on your Risk Preference

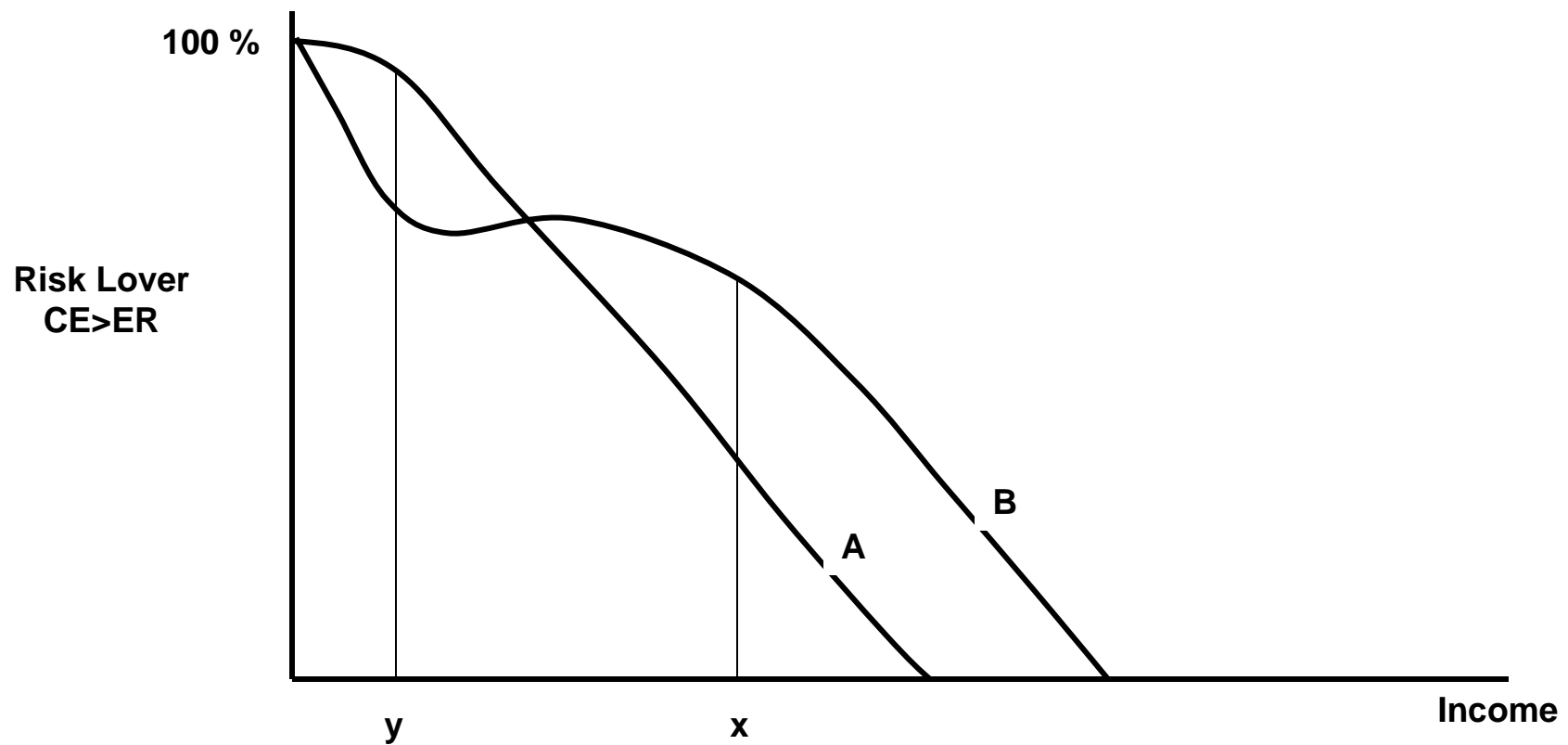


Utility Function: Risk is a Function of Wealth

Confidence Interval



Cumulative Probability Function



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Risk and Variability (SD)

Which prefers:

100 (SD=5) or 200 (SD=150)

Risk lover: \uparrow SD

Risk Averse: \downarrow SD

Risk and Time

Which prefers:

100 (today) or 200 (5 years from today)

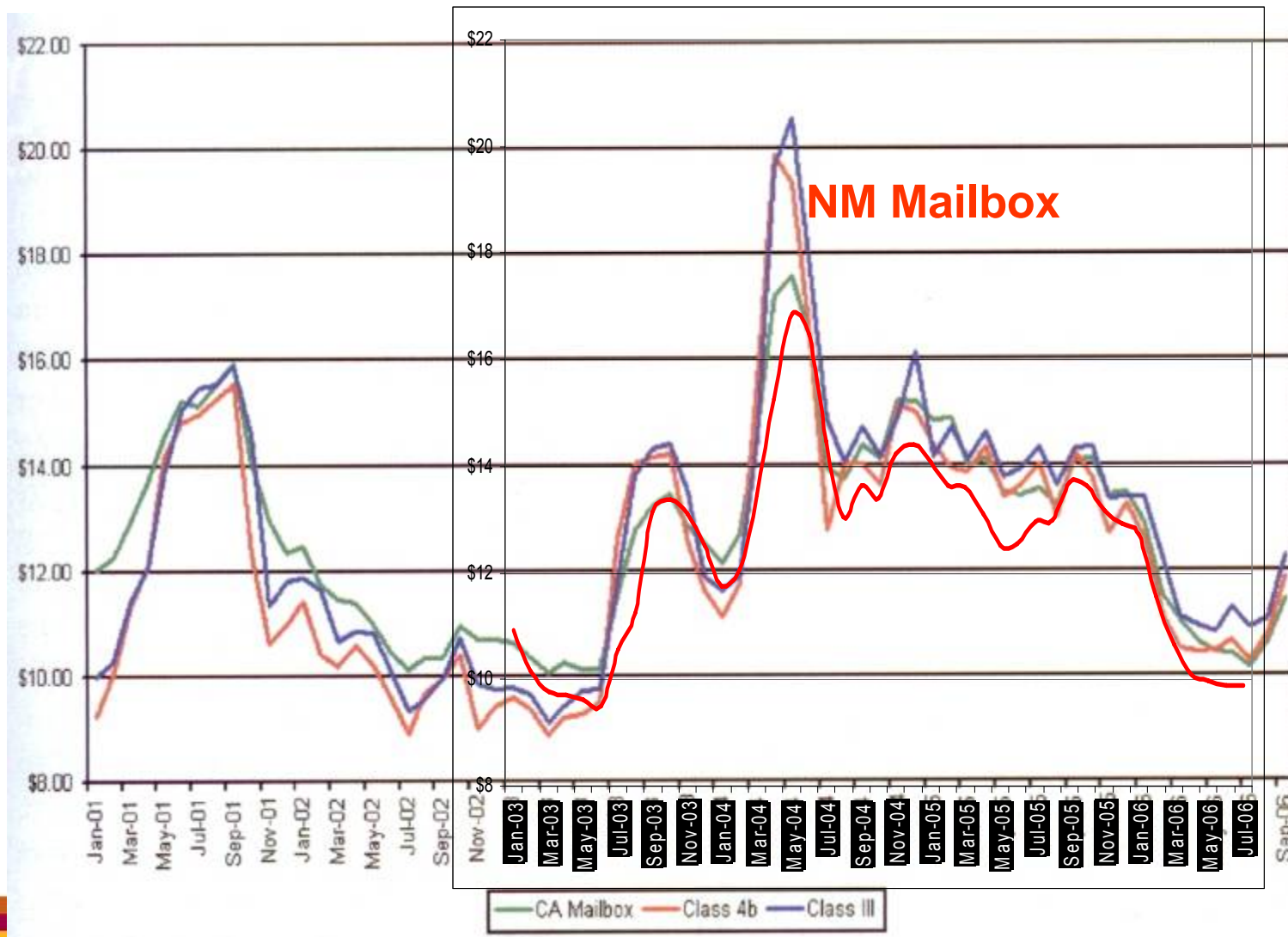
Risk lover: Today

Risk Averse: Later

How We Can Work Around Risk to Secure a Profit?

- Be part of a cooperative. May have you better prices and lower costs
- Vaccinate animals before they get sick
- Purchase insurance (crop, cow)
- Participate in Future Markets
- Diversification of Economic Activities
- Promote savings, increase equity

Why not to hedge?



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How We Can Make Better Decisions?

- Knowing when to make a decision
- Knowing when there is sufficient information
- Knowing that a good decision does not guarantee good outcomes
- Making decisions with higher frequencies of favorable outcomes
- Knowing how to separate trivial decision-making questions from the important ones

Can we see the future?

- No!, but
- We can examine the past
- We can analyze the presents, and
- We can channel the course of the future

Regardless of the uncertainty

Dairy Strategies for the Future

Adapted from the California Milk Advisory Board Depth Study for the Dairy Industry (McKinsey)

1) Minimize Environmental Mitigation Costs

- Research must pursue to mitigate the volume of regulation and ensure regulation actually helps the environment

Dairy Strategies for the Future

2) Continue Successful Promotion and Marketing Investments

- More aggressive marketing in the USA and abroad. The pool is limited and a special place for dairy products needs to be secured.

Dairy Strategies for the Future

3) Production efficiency and innovation

- Maintain and drive down costs of production
- Innovation in any level of production and processing will help

Dairy Strategies for the Future

4) Suggest favorable laws and regulations

- Legislation will always have an important role in the industry future. Dairy should ally with policy makers

Dairy Strategies for the Future

5) Control milk production volume

- Market demand / offer is driven by quantity of milk. Better control strategies are needed