Impact of Dairies in the Texas High Plains

Todd Bilby[1], Ellen Jordan[1], and Robert Hagevoort[2]
Extension Dairy Specialists

[1]Texas AgriLife Extension, Texas A&M System
[2]New Mexico State University

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Introduction

- Growth of the High Plains Dairy Industry
- Dairy Water Use
  - Region O Dairy and Crop numbers
  - 2000 cow dairy on 160 acres
- Dairy Water Capture and Reuse
  - Almost a closed loop system

2007 Milk Production
Selected States

State	Mailbox Price	Million Pounds
1)California	$17.56	40,683
2)Wisconsin	$19.12	24,080
4)Idaho	NA	11,549
8)Texas	$18.28 (W)	7,379
9)New Mexico	$17.58	7,306
10)Washington	$19.26	5,531

Range (CA-$17.56 to FL - $21.50)

2007 Milk per Cow
Selected States

State	Pounds/Cow/Year
1)Arizona	23,260
2)Washington	23,239
5)Idaho	22,513
6)California	22,440
7)New Mexico	21,363
8)Texas	21,143
U.S. Average	20,267

High Plains Dairy Production

1970	9,900 cows		84,413,000 lbs.
1980	9,000 cows		116,000,000 lbs.
1990	NA		88,000,000 lbs.*
1995	7,340	20 herds	116,821,000 lbs.*
1998	11,500	10 herds	73,688,000 lbs.*
1999	14,000	20 herds	218,167,000 lbs.*
2000	17,000	25 herds	342,000,000 lbs.*
2005	109,000	50 herds	1,987,760,000 lbs.*
2007	139,000	70 herds	3,147,000,000 lbs.*
2008	190,000	87 herds	4,161,000,000 lbs.*

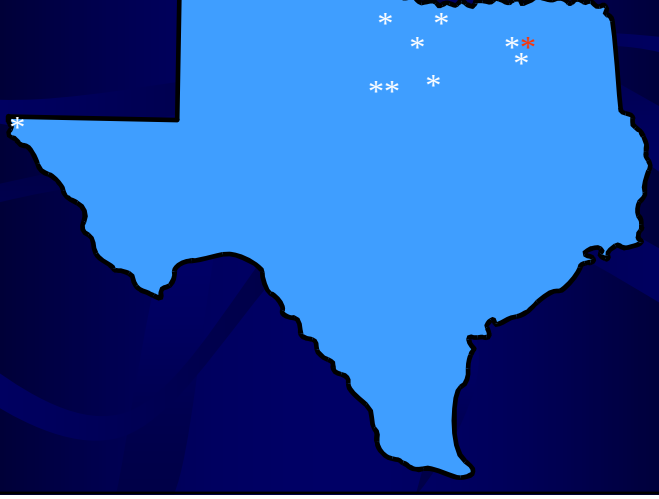
Why the Surge?

- Environmental Regulations
- Temperature
- Precipitation
- Feed Supply
- Water

Top Ten Texas Counties

1980	1990	2000
Hopkins (NE)	Erath (C)	Erath (C)
Erath (C)	Hopkins (NE)	Hopkins (NE)
Wise (NC)	Johnson (NC)	Comanche (C)
Comanche (C)	Comanche (C)	Archer (NC)
Johnson (NC)	Wood (NE)	El Paso (FW)
El Paso (FW)	Archer (NC)	Johnson (NC)
Wood (NE)	Cherokee (NE)	Wood (NE)
Archer (NC)	Wise (NC)	Hamilton (C)
Cooke (NC)	El Paso (FW)	Lamb (HP)
Franklin (NE)	Franklin (NE)	Van Zandt (NE)

1980 Top Ten Texas Dairy Counties




1990 Top Ten
Texas Dairy
Counties
D


2000 Top Ten
Texas Dairy
Counties
D

Top Ten Texas Counties

May, 2000	Jan., 2002	Dec., 2005
Erath (C)	Erath (C)	Erath (C)
Hopkins (NE)	Hopkins (NE)	Deaf Smith (HP)
Comanche (C)	Comanche (C)	Hopkins (NE)
Archer (NC)	El Paso (FW)	Comanche (C)
El Paso (FW)	Archer (NC)	Lamb (HP)
Johnson (NC)	Lamb (HP)	Castro (HP)
Wood (NE)	Hamilton (C)	Hale (HP)
Hamilton (C)	Wood (NE)	Parmer (HP)
Lamb (HP)	Johnson (NC)	Bailey (HP)
Van Zandt (NE)	Tom Green (SC)	Hartley (HP)

Top Ten Texas Counties

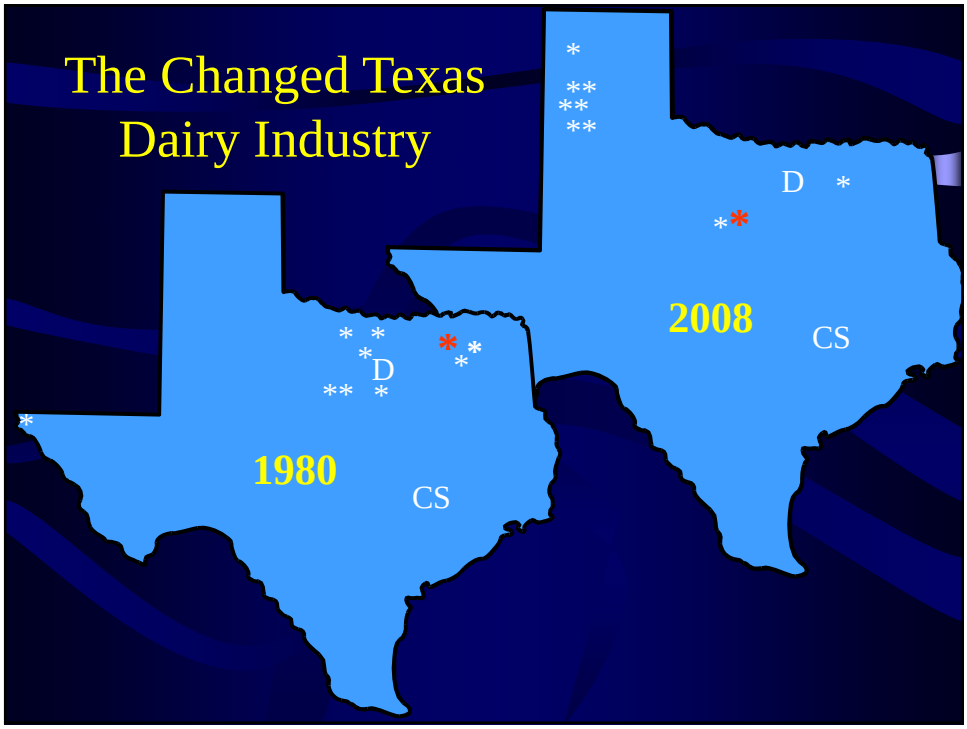
Dec., 2005	Feb., 2007	April, 2008
Erath (C)	Erath (C)	Erath (C)
Deaf Smith (HP)	Hopkins (NE)	Parmer (HP)
Hopkins (NE)	Comanche (C)	Deaf Smith (HP)
Comanche (C)	Deaf Smith (HP)	Castro (HP)
Lamb (HP)	Parmer (HP)	Hopkins (NE)
Castro (HP)	Lamb (HP)	Comanche (C)
Hale (HP)	Castro (HP)	Lamb (HP)
Parmer (HP)	Hale (HP)	Hartley (HP)
Bailey (HP)	Bailey (HP)	Bailey (HP)
Hartley (HP)	Hartley (HP)	Hale (HP)


2003 Top Ten
Texas Dairy
Counties
D


2004 Top Ten
Texas Dairy
Counties
D
CS

Dairy Movement Trends Within Texas

- Northeast to Central and now to High Plains
- Region around the Dallas-Ft. Worth metroplex has gone out of dairy.
- El Paso out of dairy in 2005 due to tuberculosis buy-out.
- Archer Co. very stable in amount produced, but displaced by higher producing counties in 2005
- Fate of Permits in Central Texas problematic



Where Are Producers Coming From?

- Netherlands via Canada
- East Texas
- Stephenville
- North Central Texas
- California
- Arizona
- New Mexico

Dairy Water Utilization

Water Utilization

- California, Idaho, New Mexico, and West Texas dependent upon irrigation
- WI, NY, PA, MN, MI, WA other top 10 states which aren't very dependent upon irrigation

Water Availability

- Two different water aquifers under parts of region
- New Mexico is beginning to have water rights issues
- Increasing demands may result in changing forages based on water requirements of crop

Water Issues Common Across Agriculture

- Water marketing/sales
- Water resource protection guidelines
- Water conservation strategies and water use efficiency
- Forage and feedstuff alternatives
- Water planning

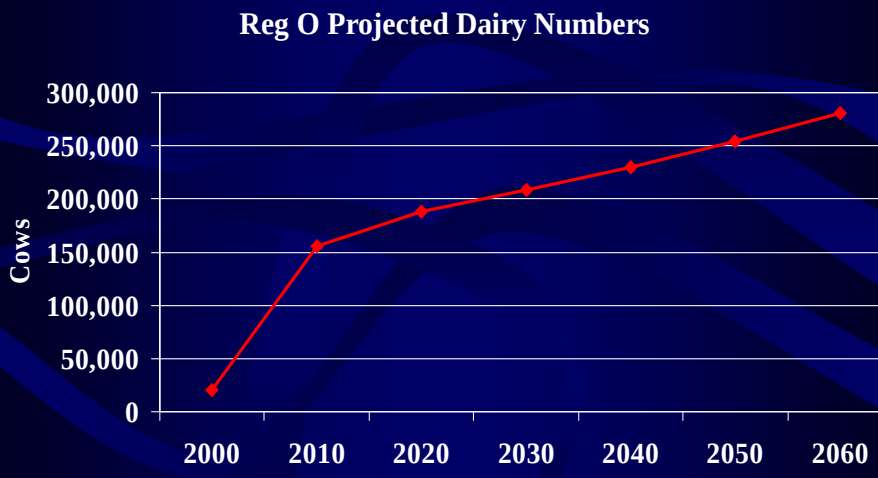
8 Counties within Region O with Dairies

- Bailey, Castro, Deaf Smith, Hale, Lamb, Lubbock, Parmer, and Terry
- In Region O these counties currently have and are projected to have dairy expansion through 2060.
- Crop production data is from the National Ag Statistical Service (NASS) database from 1995 – 2007
- Average irrigation rates were calculated using Extension budget water requirement data

Extension Budget Irrigation Rates

- Wheat – 15 acre-inches
- Sorghum, grain – 14 acre-inches
- Sorghum, silage – 13 acre-inches
- Cotton – 12 acre-inches
- Corn Silage – 22 acre-inches
- Corn, grain – 22 acre-inches
- Alfalfa – 24 acre-inches

Are Dairy Cattle Using All the High Plains Water?



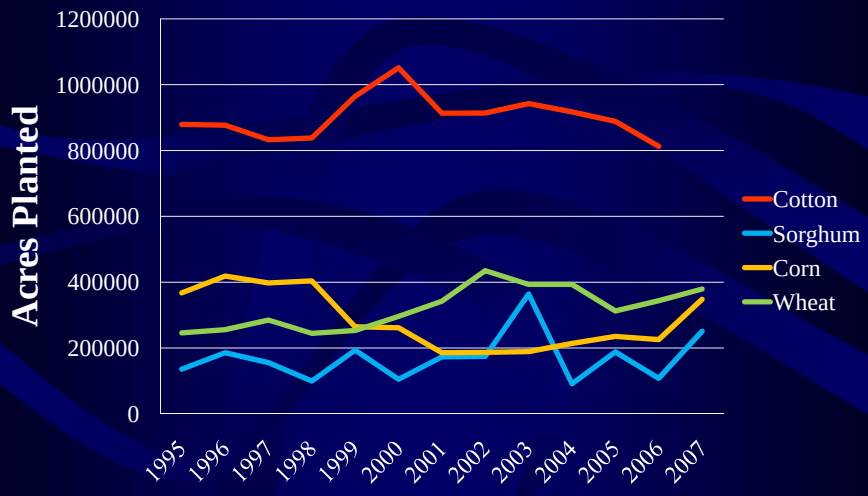
Are Dairy Cattle Using All the Panhandle Water?

Crop	Tons/Cow/yr (Wet Basis)	Acres/Cow/yr to Grow Forage
Small Grain Silage	4.1	0.4
Corn Silage	8.66	0.28
Sorghum Silage	1.32	0.06
Alfalfa Green Chop	2.62	0.13
Total	16.7	0.87

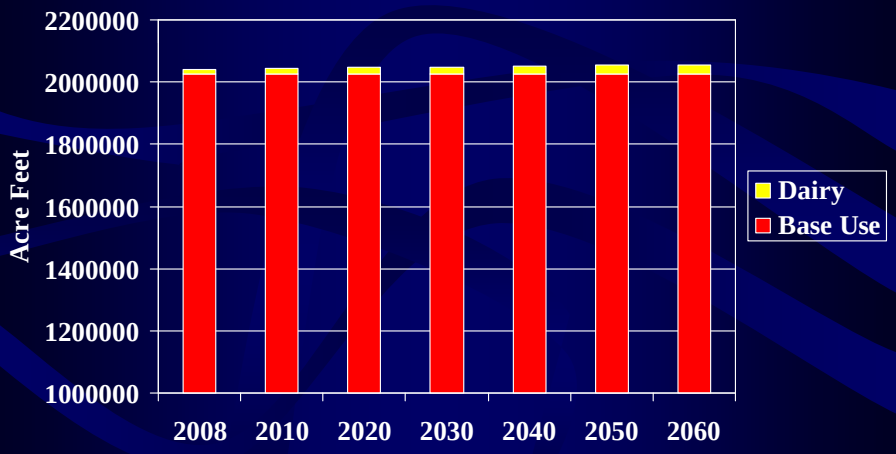
Weighted Average Irrigation Water Used in 8 Counties in Region O

- 14.5 acre inches based on average acres in cotton, corn, sorghum, and wheat from 1995 to 2007
  - NASS data does not track alfalfa so this may be underestimated
- 16.1 acre inches based on forage mix used by dairy cattle (includes alfalfa)

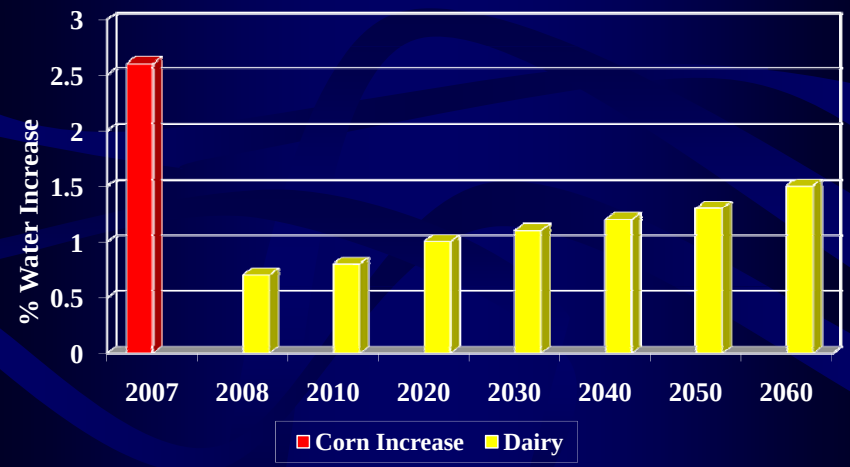
Average Irrigated Acres of Total Production in Region O



Estimated Irrigation Change with Dairy in Region O



Impact of Dairy Compared to Increased Corn Acreage in 2007 on Water Use



Is double cropping taking all the water?

- 1.7 million irrigated acres in the 8 counties with dairy in Region O
- 0.4 acres small grain silage/cow/yr x 130,000 cows = 52,000 total acres that could be potentially double cropped
- 52,000/1.7 million = 3% of acres available could be double cropped

Is double cropping taking all the water?

- 52,000 acres of small grain forage
- ??? Acres purchased from dryland and/or distressed crops
- ??? Acres from non-double cropped
- Actual acres used for double cropping hasn't been tracked
- Average water requirements for double cropping hasn't been tracked (2007 – 2 acre inches) – we know its something less than 15 inches

2000 Cow Dairy

Water Use Estimator

Use type	# Units	Unit Amt.	Gals Used	
Milk Cows	2000	38.7	77,400	Drinking
Dry Cows	400	17.3	6,920	Drinking
Heifers 1200	500	14.5	7,250	Drinking
800	500	10.6	5,300	Drinking
400	500	6.1	3,050	Drinking
200	500	3.3	1,650	Drinking
Bulk Tank	4	60	240	Cleaning
Pipeline	3	250	750	Cleaning
Misc Equip	3	30	90	Cleaning
Cow Prep	2000	0.5	1,000	Cleaning
Floor Wash	3	150	450	Cleaning
Milk House Floor	3	20	60	Cleaning
Total Usage per day			104,160	
Average per cow Drinking Only			38.7	
Average per cow Total Dairy Per Day			52.1	

Water Usage

	Average/cow	Average dairy	Percentage
Drinking water	38 gal/day	76,000 gal/day	70%
Facility operations	16 gal/day	32,000 gal/day	30%
Total	54 gal/day	108,000 gal/day	

2000 Cow Dairy on 160 Acres

Dairy Facility Use vs. Farming Use	
Drinking Water	38 gals
Facility	16 gals
Total Water/cow/day	~ 55 gals
2000 cows * 55 gals/day	110,000 gals/day
110,000 gals/day * 365	40.15 million gals
40.15 million gals/325,810 gal/acre ft	123 acre ft/yr
(123 acre ft/yr)/(160 acres) * 12	9.25 inches/acre/yr

2000 Cow Dairy on 160 acres

Dairy Facility Use vs. Farming Use	
(70 lbs of milk * $16 cwt)/100 lbs	$11.20 cow/day
$11.20 * 2000 cows * 365 days	$8,176,000 yr
Dairy	
$8,176,000 yr/(160 acres * 9.25 inches/acre/yr)	$5524 per inch water used
Corn silage	
160 acres corn silage * 27 ton/acre * $44 delivered	$190,080 per year
$190,080/(160 acres corn * 22 acre inches)	$54 per inch water used
Wheat Grain (65 bushels) plus Grazing	
160 acres * $443.70 per acre	$70,992 per year
$70,992/(160 acres * 15 acre inches)	$30 per inch water used
Cotton (1100 lbs)	
160 acres * $811.05	$129,768 per year
$129,768/(160 acres cotton * 12 acre inches)	$68 per inch water used

GENSKE, MULDER & CO., LLP
CERTIFIED PUBLIC ACCOUNTANTS

AVERAGE OF OUR TEXAS DAIRY CLIENTS
AVERAGE INCOME AND EXPENSES
FOR THE SIX MONTHS ENDED JUNE 30, 2007

	PANHANDLE TEXAS				CENTRAL TEXAS				TOTAL TEXAS			
	AMOUNT	PER CWT	PER COW	PER CENT	AMOUNT	PER CWT	PER COW	PER CENT	AMOUNT	PER CWT	PER COW	PER CENT
INCOME:												
Milk	$4,998,069	$16.41	$1,572	97.7 %	$3,255,192	$17.35	$1,691	97.5 %	$3,950,319	$16.83	$1,628	97.6 %
Milk futures	(25,449)	(0.08)	(8)	(0.5)	0	0.00	0	0.0	(10,180)	(0.04)	(4)	(0.2)
Calves and heifers	70,695	0.23	22	1.4	43,461	0.23	23	1.3	54,354	0.23	22	1.3
Patronage dividend	49,412	0.16	16	0.9	15,659	0.08	8	0.5	28,290	0.12	12	0.7
Other	24,422	0.08	8	0.5	22,794	0.12	12	0.7	23,448	0.10	10	0.6
Total income	$5,112,089	$16.80	$1,610	100.0 %	$3,337,306	$17.78	$1,734	100.0 %	$4,017,218	$17.27	$1,669	100.0 %
EXPENSES:												
Feed:												
Hay	$1,193,869	$3.92	$376	23.4 %	$683,331	$3.64	$355	20.5 %	$887,520	$3.79	$368	21.9 %
Grain	1,482,874	4.87	467	29.0	970,059	5.17	504	29.1	1,175,223	5.01	484	29.0
Less cost of feeding heifers	(667,632)	(2.19)	(210)	(13.1)	(263,559)	(1.40)	(137)	(7.9)	(425,200)	(1.81)	(176)	(10.5)
Total feed	$2,009,111	$6.60	$633	39.3 %	$1,389,831	$7.41	$722	41.7 %	$1,637,543	$6.99	$675	40.4 %
Herd replacement cost:												
Depreciation - dairy cows	$350,075	$1.15	$110	6.9 %	219,634	$1.17	$114	6.6 %	$271,810	$1.16	$112	6.7 %
Loss on sale of cows	304,001	1.00	96	5.9	59,879	0.32	31	1.8	157,528	0.67	65	3.9
Total herd replacement cost	$654,076	$2.15	$206	12.8 %	$279,513	$1.49	$145	8.4 %	$429,338	$1.83	$177	10.6 %
Other operating expenses:												
Interest and rent	$498,320	$1.68	$162	9.4 %	$208,696	$1.10	$107	6.2 %	$317,286	$1.35	$131	7.8 %
Equipment lease	16,913	0.05	5	0.3	2,726	0.01	1	0.1	8,402	0.04	3	0.2
Labor	462,676	1.52	146	9.1	255,790	1.36	133	7.7	339,544	1.45	140	8.4
Depreciation - other	219,657	0.72	69	4.3	151,429	0.81	79	4.5	178,640	0.76	74	4.4
Milk hauling	277,285	0.91	87	5.4	187,306	1.00	97	5.6	223,298	0.95	92	5.5
Industry assessments	85,725	0.28	27	1.7	54,733	0.29	28	1.6	67,130	0.29	28	1.7
Supplies	147,648	0.48	46	2.9	105,742	0.56	55	3.2	122,505	0.52	51	3.0
BST	0	0.00	0	0.0	4,703	0.02	2	0.1	2,823	0.01	1	0.1
Corral cleaning	8,874	0.03	3	0.2	16,285	0.09	8	0.5	13,247	0.06	5	0.3
Repairs and maintenance	139,377	0.46	44	2.7	92,664	0.49	48	2.8	111,291	0.48	46	2.8
Utilities	99,164	0.33	31	1.9	69,612	0.36	36	2.1	80,845	0.35	33	2.0
Taxes and licenses	47,159	0.15	15	0.9	36,242	0.19	19	1.1	40,609	0.17	17	1.0
Insurance	57,461	0.19	18	1.1	24,993	0.13	13	0.7	37,912	0.16	16	0.9
Fuel and oil	69,689	0.23	22	1.3	44,657	0.24	23	1.3	54,296	0.23	22	1.4
Legal and accounting	26,971	0.10	8	0.6	8,104	0.06	5	0.3	17,378	0.07	7	0.4
Employee benefits	16,932	0.06	5	0.4	11,099	0.06	6	0.3	14,092	0.06	6	0.4
Veterinary and breeding	139,168	0.46	44	2.7	98,675	0.53	51	3.0	114,490	0.49	47	2.8
Testing and trimming	30,271	0.10	10	0.6	20,017	0.11	10	0.6	24,119	0.10	10	0.6
Hauling livestock	15,889	0.05	5	0.3	4,853	0.03	3	0.1	8,286	0.04	4	0.2
Miscellaneous	6,729	0.02	2	0.2	4,906	0.03	3	0.1	6,483	0.03	3	0.2
Less cost of raising heifers	(86,629)	(0.28)	(28)	(1.7)	(60,719)	(0.32)	(32)	(1.8)	(71,898)	(0.31)	(30)	(1.8)
Total other operating expenses	$2,267,010	$7.45	$714	44.3 %	$1,340,278	$7.14	$697	40.1 %	$1,710,973	$7.30	$706	42.3 %
Total expenses	$4,930,197	$16.20	$1,553	96.4 %	$3,009,622	$16.04	$1,564	90.2 %	$3,777,854	$16.12	$1,558	93.3 %
NET INCOME	$181,892	$0.60	$57	3.6 %	$327,684	$1.74	$170	9.8 %	$269,364	$1.15	$111	6.7 %

AVERAGE DAIRY STATISTICAL DATA:	PANHANDLE TEXAS	CENTRAL TEXAS	TOTAL TEXAS
Average number of milking cows	2,996	1,677	2,014
Average daily production per cow	65	66	66
Average butterfat test	3.67 %	3.71 %	3.69 %
Average protein test	3.05 %	3.05 %	3.05 %
Average somatic cell count	219,976	264,146	229,806
Herd turnover rate	33.96 %	28.25 %	30.14 %

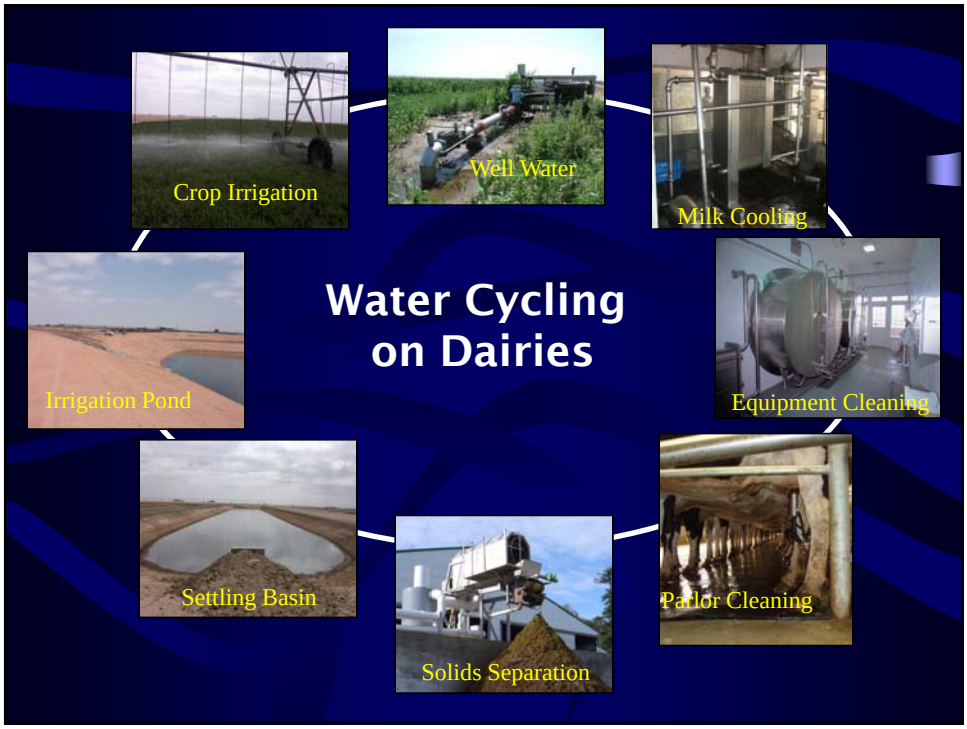
Water used in a year by a 2000 cow dairy on 160 acres is equal to enough water to irrigate;

67 acres of corn silage,
98 acres of irrigated wheat grain,
or 123 acres of cotton

New Mexico Water Utilization

- Unlike irrigators, dairies must submit monthly meter readings to OSE (and NMED)
- These readings and State Engineer records indicate the top six dairy producing counties use **less than 2% of total ground water diversions** in New Mexico.
- Dairies are using declared and permitted water rights that would otherwise be put to beneficial use by other water users
- Dairies use water several times over rather than just once

Dairy Water Use Efficiency


Crop Irrigation
Well Water
Milk Cooling
Water Cycling on Dairies
Irrigation Pond
Equipment Cleaning
Settling Basin
Parlor Cleaning
Solids Separation


Water Cycling on Dairies

Thank You!

Todd Bilby, Ph.D.
Texas Extension Dairy Specialist
Cell: 254-434-1777
trbilby@ag.tamu.edu

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