

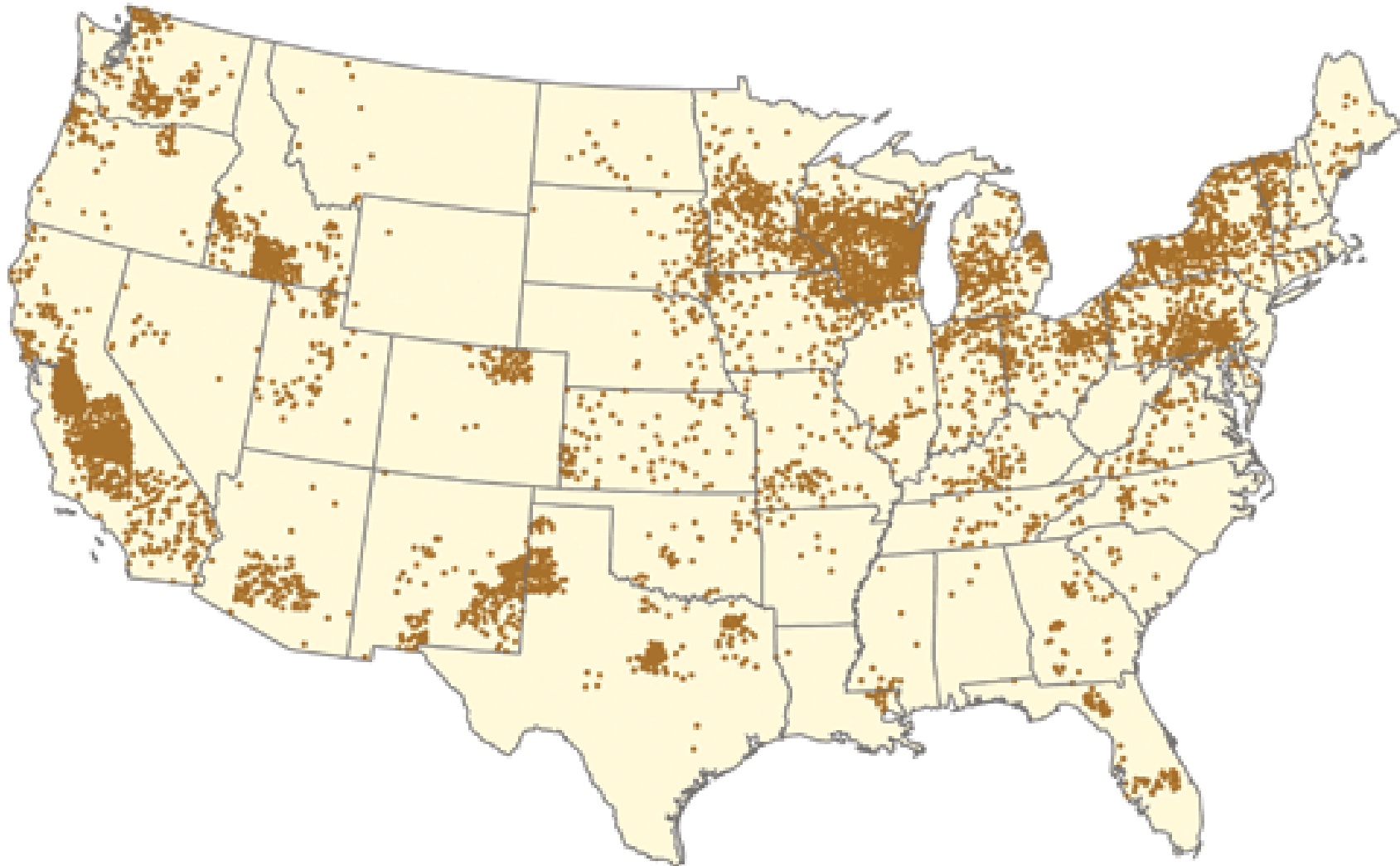
Regulatory and Financial Risks Impacting Western Dairy Producers

Western Extension Committee Western Dairy Industry Challenges Symposium

July 1, 2019

Shannon Neibergs
sneibergs@wsu.edu

Regional Concentration of Dairy Cows



Growth and Decline in Milk Production

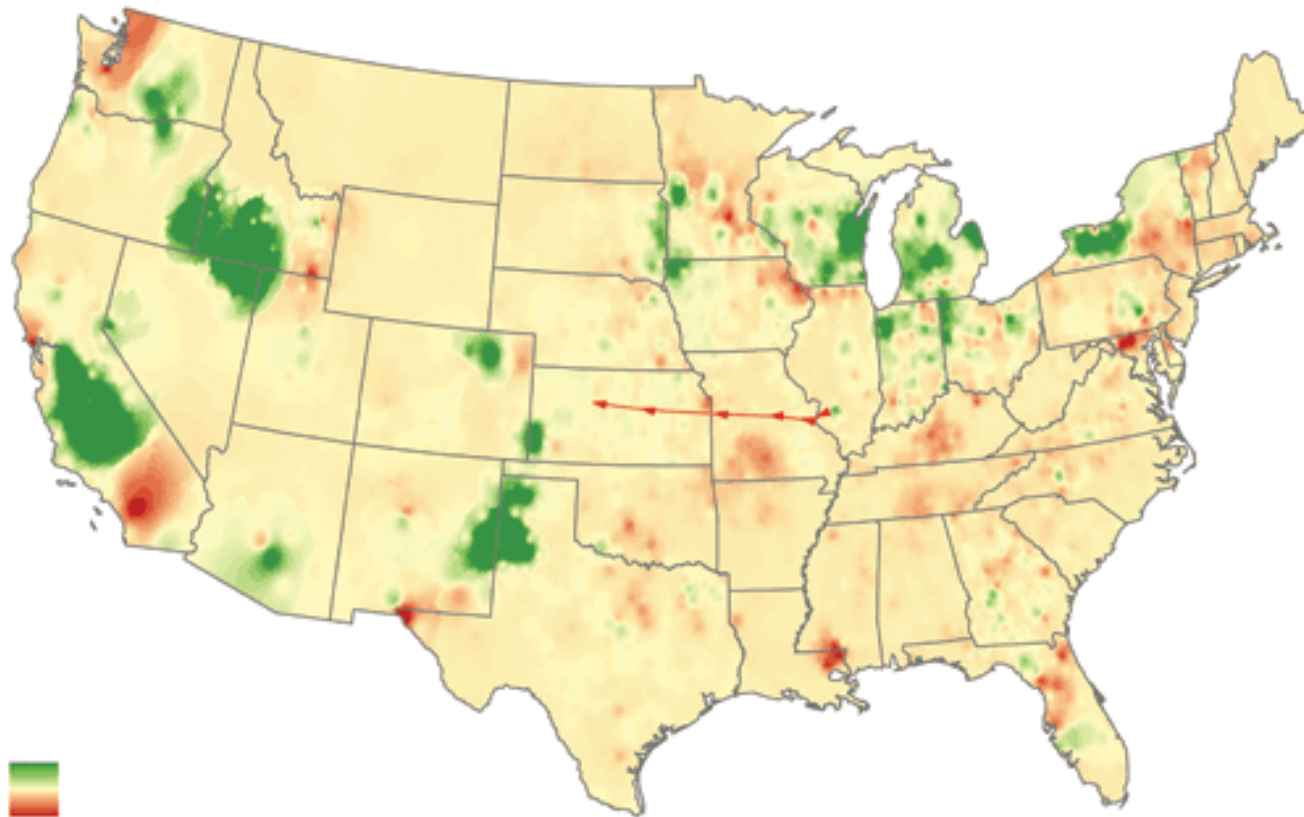
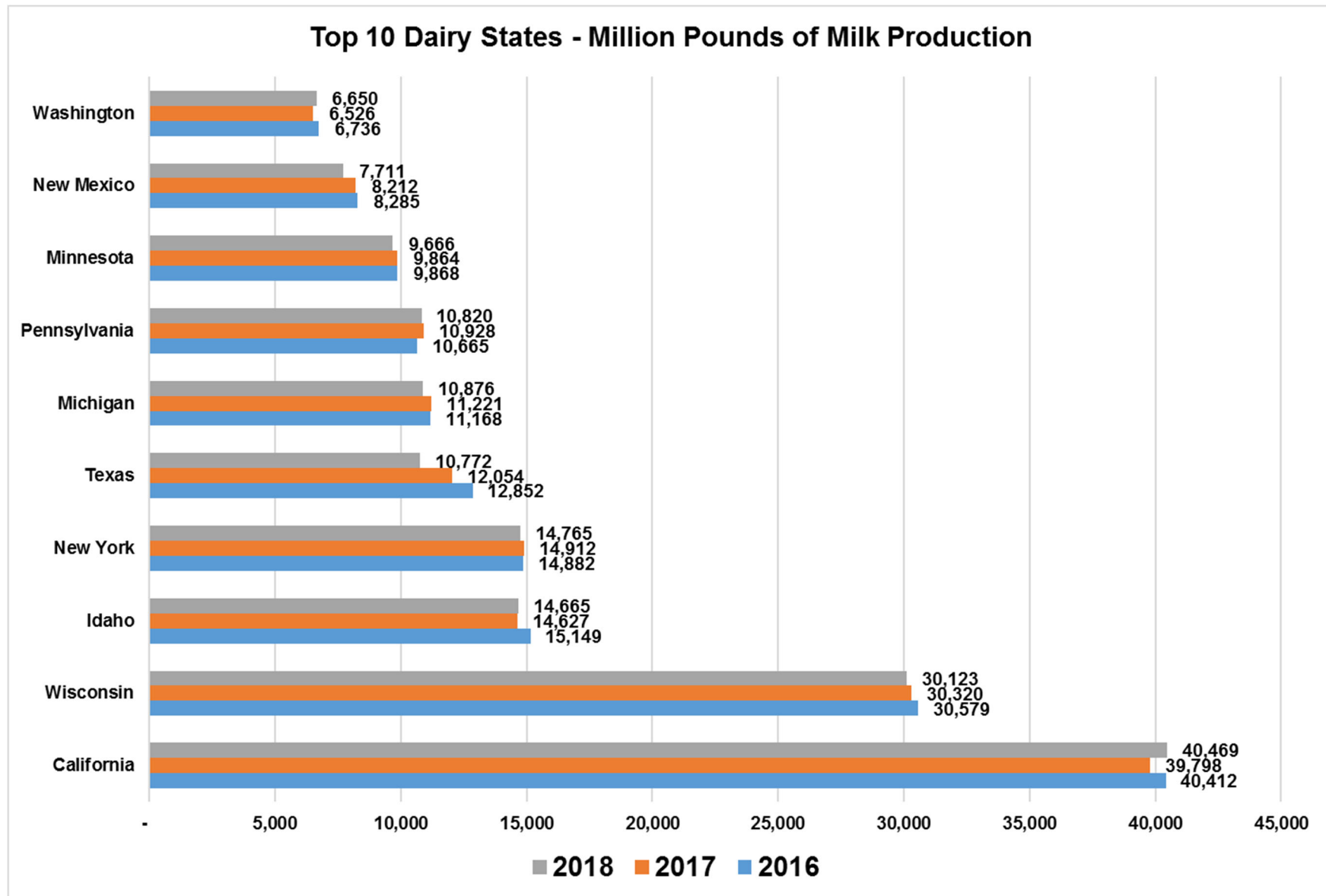


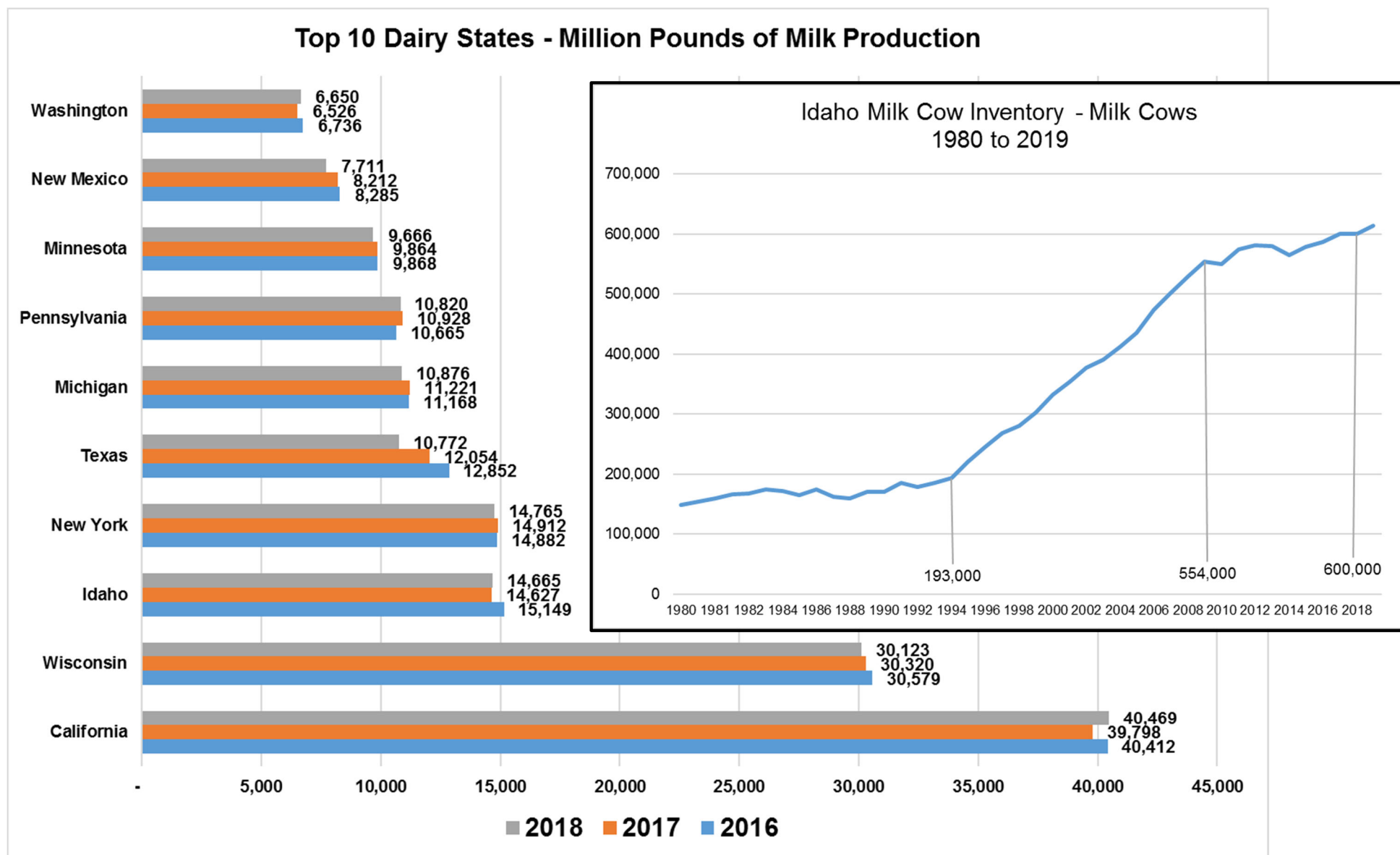
Chart: Green= Largest increase = 2,596,898 kg/km²

Rust= Largest decline = 295,363 kg/km²

Importance of Dairy Across the West



Importance of Dairy Across the West



Dairy is a Top 3 Commodity in 9 of 13 Western States

Top Agriculture Commodities in Western States			
State	1	2	3
Alaska	greenhouse	hay	potatoes
Washington	apples	dairy	wheat
Idaho	dairy	cattle	potatoes
Oregon	greenhouse	cattle	dairy
California	dairy	greenhouse	grapes
New Mexico	dairy	cattle	hay
Arizona	dairy	cattle	greenhouse
Nevada	cattle	hay	dairy
Utah	dairy	cattle	hay
Colorado	cattle	dairy	hay
Hawaii	greenhouse	sugarcane	macadamia nuts
Montana	wheat	cattle	barley
Wyoming	cattle	hay	sheep/hogs

<https://www.ers.usda.gov/StateFacts/>

May 30 2019, with data from the 2017 Census of Agriculture

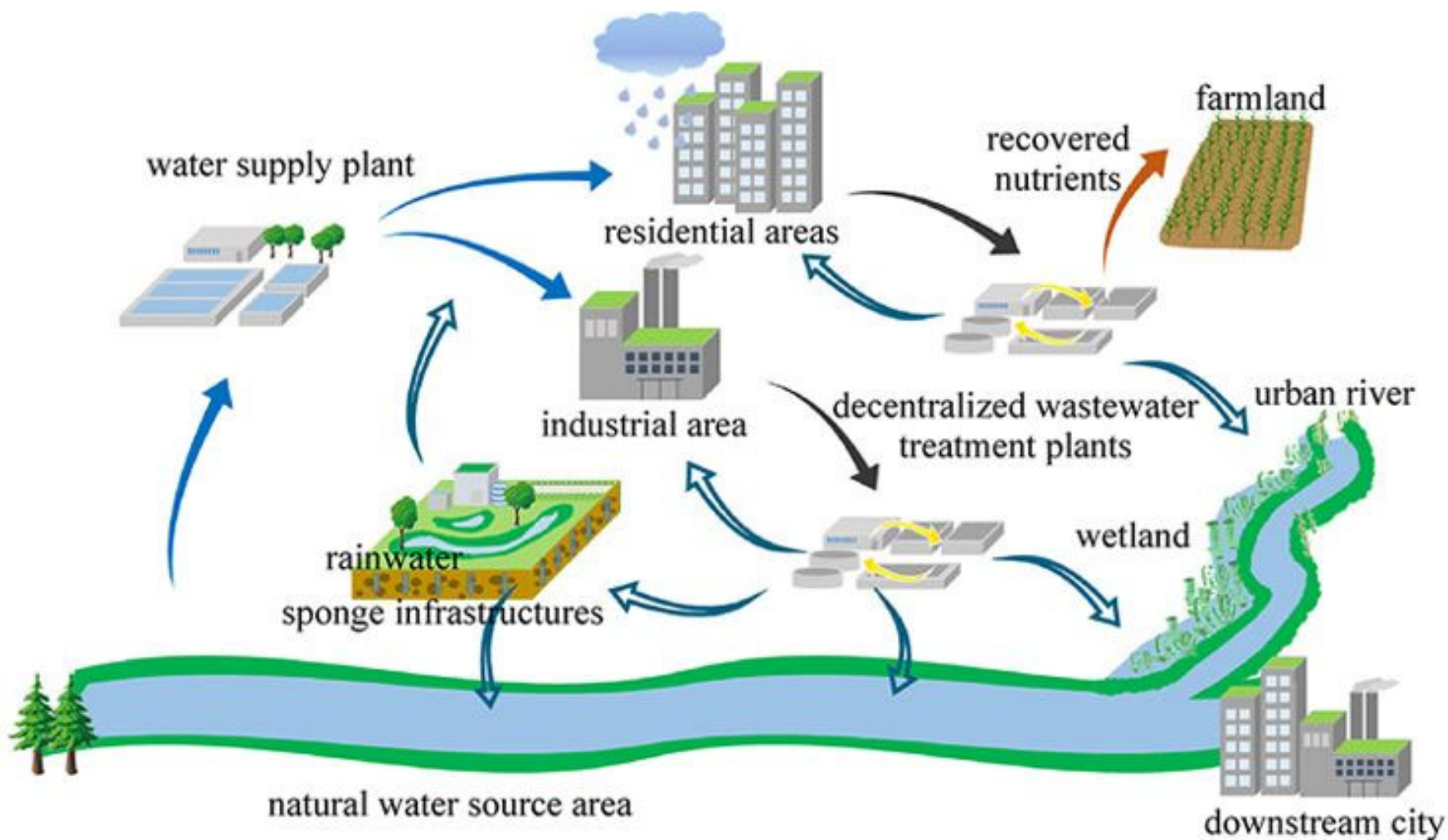
Dairies Generate a Large Amount of Potential Pollutants

Dairy Cow versus Human Waste Generation Comparison

					2,000 Cow	Human
		Dairy Cow	Human	1 Cow/Human	Dairy	Population
Volume	kg	590	63	9	2,000	18,000
Total Solids	g	7100	160	44	2,000	88,000
Total Nitrogen	g	260	9.1	29	2,000	58,000
Total Phosphorous	g	55	1.8	31	2,000	62,000
Total Coliform Bacteria	number	6.5E+12	2.3E+11	28	2,000	56,000

Fleming, R. and M. Ford, Human versus Animals - Comparison of Waste Properties
https://www.ridgetownnc.com/research/documents/fleming_huvsanim0107.PDF

Technology Exists to Manage Waste Stream – eg. City Sewer



Economics of public utility pricing

- marginal cost pricing
- average cost pricing
- tiered use pricing

Pseudo Dairy Waste Model Specification for Discussion

- Perfect competition market structure and inelastic over supply in milk does not allow for increased waste management costs to be passed on to consumers
- Dairy farm bears cost of manure management compliance

Z_t = Manure Managment Cost in year t

$$\text{Min } Z_t = \sum_i^n \text{Var Cost } it + \sum_j^o \text{Fixed Cost } jt - \sum_k^p \text{Revenue } kt - \sum_l^q \text{Subsidy } lt + \sum_m^r \partial \text{Fine } mt$$

Subject To:

CAFO Regulatory Requirments Federal and State:

NPDES

Air Quality: Green House Gasses (CH_4), Odor, Dust, Flies

Application Field Nutrient Balance Soil Testing



FACT SHEET
Office of Wastewater Management
NPDES Regulations Governing Management
Of Concentrated Dairy Cattle Feeding Operations

In California's Methane-Reduction Crosshairs, Dairy Industry Faces Regulation for the First Time

S4.I. Soil Sampling and Nutrient Analysis

Soil sampling and analysis must follow the requirements of special condition S5.C.

Concentrated Animal Feeding Operation State Waste Discharge General Permit
Effective March 3, 2017

One Fine Example

Lincoln County Dairy could face \$70,000 fine for byproduct dumping

By KMVT Staff | Posted: Fri 11:02 PM, Apr 07, 2017 | Updated: Mon 2:58 PM, Apr 10, 2017



SHOSHONE, Idaho (KMVT/KSVT) 4 Bros Dairy faces a potential \$70,000 fine from the Idaho State Department of Agriculture.

The ISDA was investigating the dairy in relation to contamination of wells in Lincoln and Gooding counties.

In the investigation summary KMVT obtained from the ISDA, it explains how investigators received reports on Feb. 20 about the dairy discharging waste water into the canal. The next day an ISDA investigator went to the dairy and met with the owners. They showed the investigator where water was overflowing from one lagoon and one lagoon the dairy had "opened with an excavator to allow wastewater to flow into the adjacent Milner Gooding canal."



The investigator took photos and water samples of the dairy accompanied by the dairy's owners. They sent the samples to Magic Valley Labs for analysis. Some of the water tests came back positive for E.Coli, total coliform and ammonia.

"These results indicate the primary source of the waste water in the Milner Gooding canal originated from 4 Bros. Dairy," the report said.

Increasing Regulatory Risk Outlook - 1

JUNE 19, 2019



Strap In: Environmental Pressure is Accelerating

🕒 June 18, 2019 👤 DairyBusiness News Team DP 📁 All Breeds Blog, News 💬 0



Conversation about the environment is growing and so is the scrutiny applied to consumption of natural resources. If you think it's intense now, hold on tight because every indication is pressure will intensify by multiples and agriculture will be pressed like never before to go farther faster in reducing its carbon footprint, according to Terri Moore with The Center for Food Integrity (CFI).

Increasing Regulatory Risk Outlook - 2

80th OREGON LEGISLATIVE ASSEMBLY--2019 Regular Session

B-Engrossed House Bill 2020

Ordered by the House June 12
Including House Amendments dated May 21 and June 12

Sponsored by JOINT COMMITTEE ON CARBON REDUCTION



The image is a screenshot of a CBS News website article. At the top, the CBS News logo is on the left, and navigation links for NEWS, SHOWS, and LIVE are in the center. To the right of these links are icons for a grid and a search function. The main headline, in large white serif font, reads: "Oregon Republicans go missing to avoid climate change vote; governor sends police to find them". Below the headline, in smaller white text, is the byline "BY TRE'VAUGHN HOWARD" and the date/time "JUNE 20, 2019 / 10:33 PM / CBS NEWS". At the bottom right of the article preview, there are three social media icons: Facebook, Twitter, and a generic share icon.

CBS NEWS NEWS ▾ SHOWS ▾ LIVE ▾

Oregon Republicans go missing to avoid climate change vote; governor sends police to find them

BY TRE'VAUGHN HOWARD
JUNE 20, 2019 / 10:33 PM / CBS NEWS

f t

Increasing Regulatory Risk Outlook - 3

[SUCCESS STORIES](#)[THE COLUMBIA](#)[OUR WORK](#)[ABOUT US](#)[TAKE ACTION](#)[LATEST UPDATES](#)[EVENTS](#)[WAYS TO GIVE](#)[DONATE](#)

OREGON MEGA-DAIRY REFORM BILLS DIE, THREATENING REPEAT OF LOST VALLEY DISASTER

April 12, 2019

Oregon's legislature ignored your calls to place a 'time-out' on new mega-dairies in Oregon and another bill to limit their unsustainable use of threatened groundwater. The bills came in response to the regulatory failures that led to the 30,000-cow Lost Valley mega-dairy in eastern Oregon, which racked up over 200 permit violations and threatened groundwater during two years of operation.

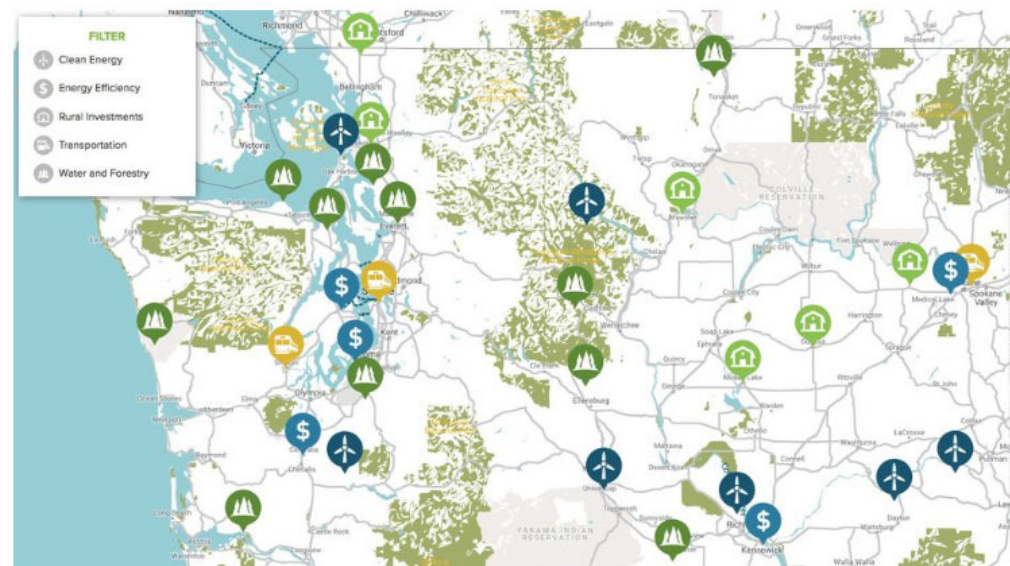
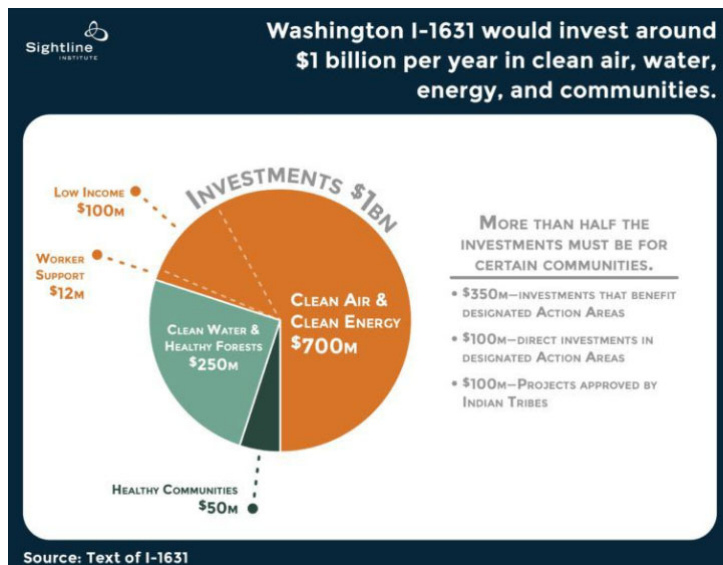
Increasing Regulatory Risk Outlook - 4

Washington votes no on a carbon tax — again

A New Green Deal goes down to defeat in the Pacific Northwest.

By David Roberts | @drvox | david@vox.com | Updated Nov 6, 2018, 12:13pm EST

UPDATE, November 6: Well, the results are in, and 1631 lost, pretty decisively (56-44). That makes two (or more, depending on how you count) comprehensive political strategies for carbon pricing in Washington that have failed. This is a serious setback for climate hawks. See below for an account of the stakes.



Increasing Regulatory Risk Outlook – 5

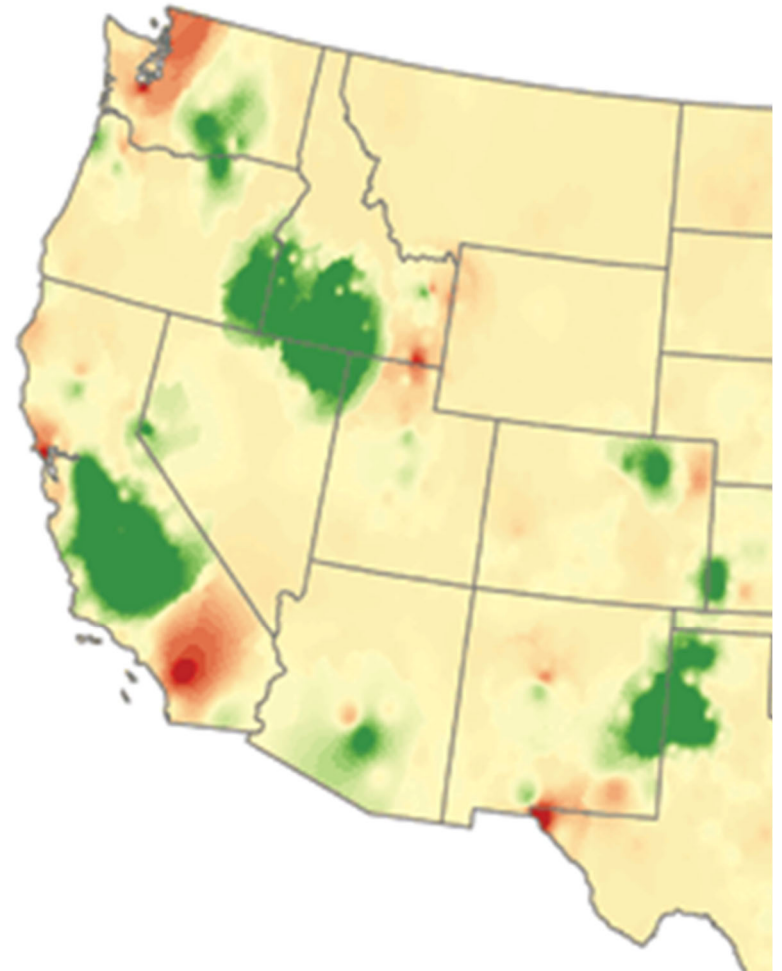
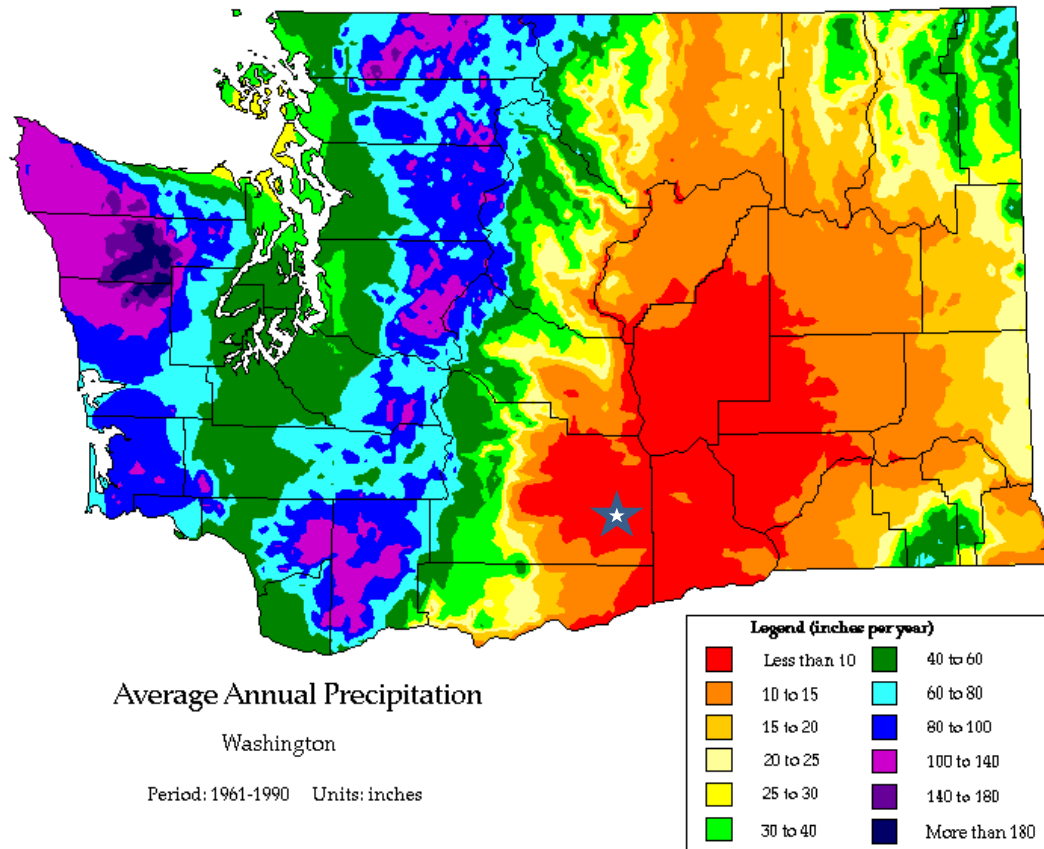
SULLIVAN & WORCESTER ENVIRONMENT & NATURAL RESOURCES
ADVISORY

Federal Court Rules that Dairy Farm's Mismanagement of Cow Manure Violates Resource Conservation and Recovery Act

A Federal District Court recently ruled on summary judgment motions that the manure management practices of a large dairy operation violated the Resource Conservation and Recovery Act (RCRA). In the case of *Community Association for Restoration of the Environment, Inc. et al v Cow Palace LLC et al*, No. 13-CV-3016, the U.S. District Court for the Eastern District of Washington found that the dairy's practices, which ignored appropriate criteria for management of manure as fertilizer, constituted open dumping of a solid waste. The Court further ruled that the dairy's actions presented an imminent and substantial endangerment to human health and the environment due to the contribution to elevated nitrate levels in nearby groundwater and drinking water.



Cow Palace Location and WA Rainfall



Increasing Regulatory Risk Outlook – 5.1

Dairies settle landmark cow-manure case after federal judge rules solid-waste law applies

BY MARTHA NEIL

MAY 11, 2015, 3:25 PM CDT

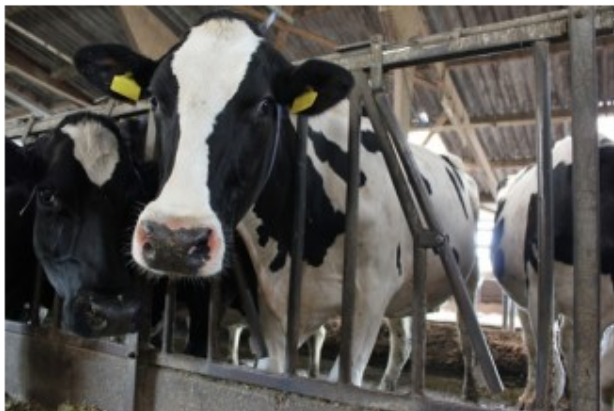


Image from [Shutterstock](#).

[Washington Times](#) reports.

It requires mitigation measures intended to bring the dairies into compliance with RCRA solid-waste rules, including a reduction in the use of manure as fertilizer and installing double linings in storage lagoons. Meanwhile, the dairies must provide clean water to residents until the cleanup is complete.

The Public Justice law firm represented the community groups that filed the suit.

Debora Kristensen of Boise, Idaho-based Givens Pursley represented Cow Palace.

For decades after Congress enacted the [Resource Conservation and Recovery Act](#), dairy farmers didn't think it applied to them.

That changed early this year, when a federal judge in Washington state ruled in a lawsuit that RCRA did apply to dairies. Hence, said U.S. District Judge Thomas Rice, the statute required them to clean up their act concerning large quantities of cow manure that plaintiffs say have been contaminating the water supply in the Yakima area with nitrates, the [Capital Press](#) reported at the time of the Jan. 14 ruling.

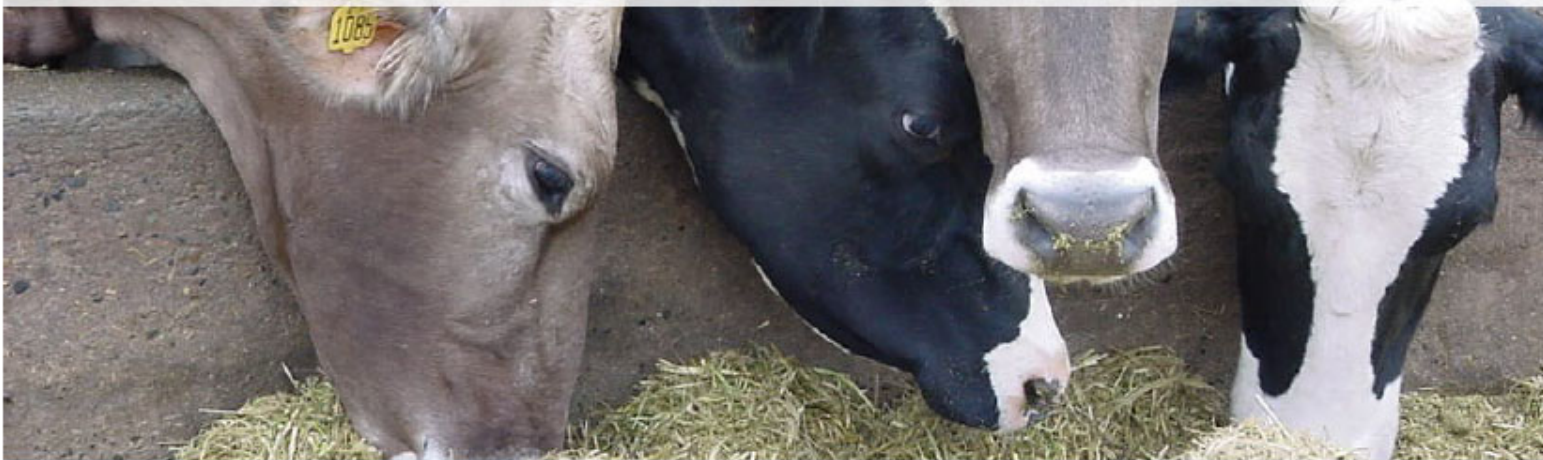
Rice's refusal to grant a summary judgment motion by the defendant Cow Palace Dairy set the stage for the environmental case to proceed to a damages trial, but on Monday a settlement by Cow Palace and three other dairies was announced, the

Increasing Regulatory Risk Outlook – 5.2

January 2017



Concentrated Animal Feeding Operation Permit



For more information contact:

Jon Jennings
360-407-6283
jonathan.jennings@ecy.wa.gov

Why it matters

The Washington Department of Ecology has issued an updated water quality permit that requires large-scale livestock facilities, called Concentrated Animal Feeding Operations (CAFOs), to implement specific practices to better protect groundwater, rivers, lakes and marine waters from manure pollution. The permit changes are based on substantial feedback we received from stakeholders and the public.



**LIVESTOCK
NUTRIENT
LAWS AND
RULES**

Increasing Regulatory Risk Outlook – 5.3

January 2017

Concentrated Animal



For more information contact:

Jon Jennings

360-407-6283

jonathan.jennings@ecy.wa.gov

Why it matters

The Washington permit for concentrated animal feeding operations (CAFOs) changes public.

POLLUTION CONTROL HEARINGS BOARD STATE OF WASHINGTON

WASHINGTON STATE DAIRY
FEDERATION, the WASHINGTON FARM
BUREAU, PUGET SOUNDKEEPER
ALLIANCE, COMMUNITY
ASSOCIATION FOR RESTORATION OF
THE ENVIRONMENT (CARE), FRIENDS
OF TOPPENISH CREEK, SIERRA CLUB,
WATERKEEPER ALLIANCE, CENTER
FOR FOOD SAFETY, and RE SOURCES
FOR SUSTAINABLE COMMUNITIES

Appellants,

v.

STATE OF WASHINGTON,
DEPARTMENT OF ECOLOGY,

Respondent.

PCHB No. 17-016c

CONSOLIDATION AND PREHEARING
ORDER

Appellants Washington State Dairy Federation, and the Washington Farm Bureau filed an appeal with the Pollution Control Hearings Board (Board) on February 17, 2017, challenging the Concentrated Animal Feeding Operation General Permit (NPDES and State Waste Discharge General Permits) issued by the State of Washington, Department of Ecology on January 18, 2017. This appeal was assigned PCHB case number 17-016.

Also on February 17, 2017, Appellants Puget Soundkeeper Alliance, Community Association for Restoration of the Environment (CARE), Friends of Toppenish Creek, Sierra Club, Waterkeeper Alliance, Center for Food Safety, and RE Sources for Sustainable Communities filed an appeal challenging the Concentrated Animal Feeding Operation General

Increasing Regulatory Risk Outlook – 5.4

ENVIRONMENTAL HEARINGS
Pollution Control Hearings Board
Shorelines Hearings Board



Telephone: (360) 664-9160
FAX: (360) 586-2253
Email: eluho@eluho.wa.gov
Website: www.eluho.wa.gov

STATE OF WASHINGTON
ENVIRONMENTAL AND LAND USE HEARINGS OFFICE

*Mailing Address: PO Box 40903, Olympia, WA 98504-0903 •
Physical Address: 1111 Israel Rd SW, Suite 301, Tumwater, WA 98501 •*

October 25, 2018

**HEARINGS BOARD
WASHINGTON**

PCHB No. 17-016c

**CONSOLIDATION AND PREHEARING
ORDER**

**POLLUTION CONTROL HEARINGS BOARD
STATE OF WASHINGTON**

WASHINGTON STATE DAIRY
FEDERATION, the WASHINGTON FARM
BUREAU, PUGET SOUNDKEEPER
ALLIANCE, COMMUNITY
ASSOCIATION FOR RESTORATION OF
THE ENVIRONMENT (CARE), FRIENDS
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FOR FOOD SAFETY, and RE SOURCES
FOR SUSTAINABLE COMMUNITIES

Appellants,

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STATE OF WASHINGTON,
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**FINDINGS OF FACT, CONCLUSIONS OF
LAW AND ORDER**

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Increasing Regulatory Risk Outlook – 5.4

ENVIRONMENTAL HEARINGS
Pollution Control Hearings Board
Shorelines Hearings Board



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
ENVIRONMENTAL AND LAND USE DIVISION

Mailing Address: PO Box 40
Physical Address: 1111 Israel Rd.

October

POLLUTION CONTROL STATE OF WASHINGTON

WASHINGTON STATE DAIRY
FEDERATION, the WASHINGTON FARM
BUREAU, PUGET SOUNDKEEPER
ALLIANCE, COMMUNITY
ASSOCIATION FOR RESTORATION OF
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Appellants,

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REHEARING

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January 18,

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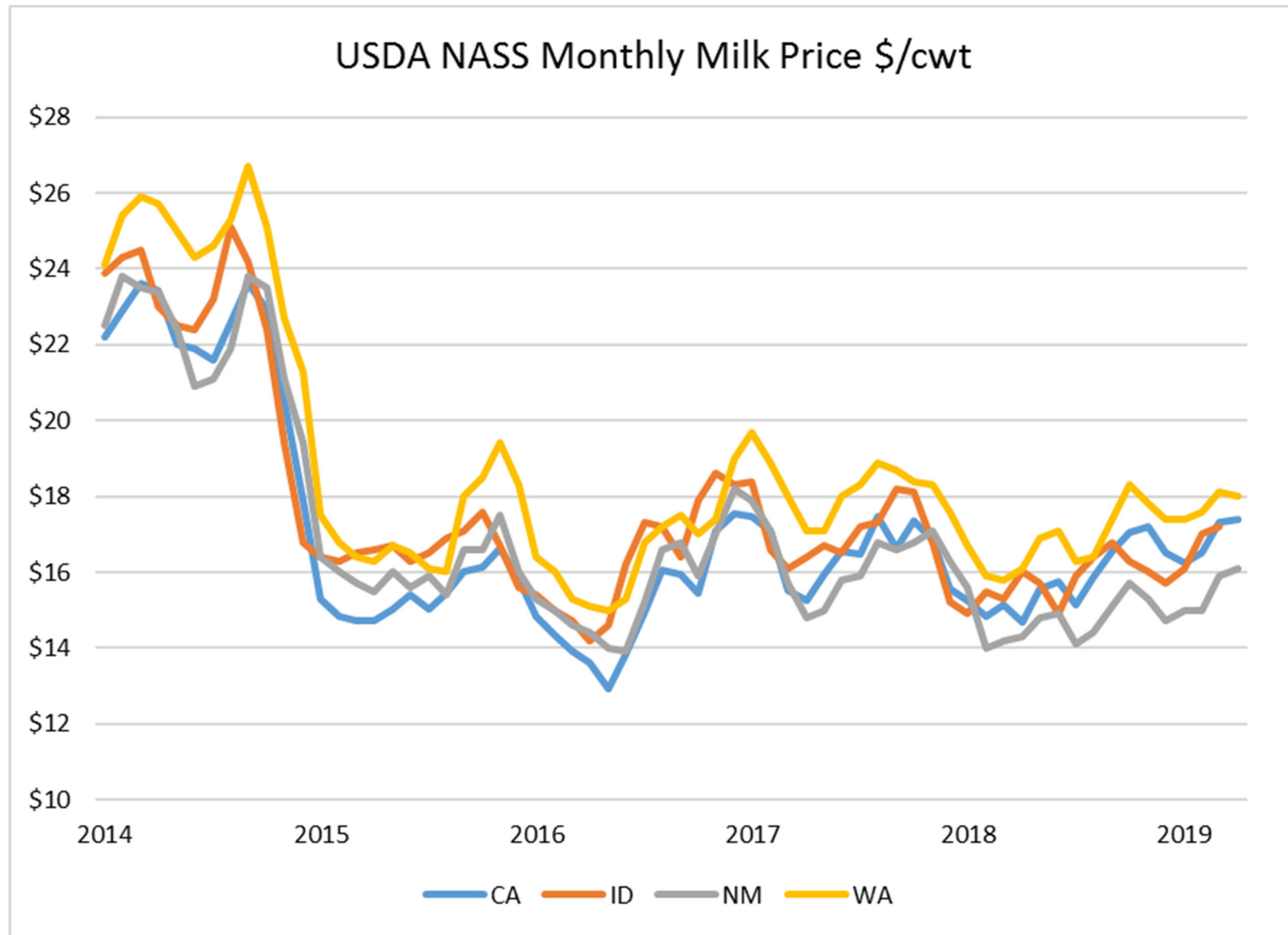
First Half 2018 Financial Risk

Income and Costs per Cow by Region For the Six Months Ended **June 30, 2018**

	Southern California	San Joaquin Valley	Kern County	Arizona	Idaho	New Mexico	Panhandle	Pacific Northwest
	\$ / Cow							
Milk Sales	1,924	1,885	1,722	1,740	1,757	1,759	1,753	1,859
Calves/ other	55	77	45	36	9	32	21	15
Total Income	1,979	1,962	1,767	1,776	1,766	1,791	1,774	1,874
Total Feed	1,218	1,080	1,025	1,054	926	1,048	863	889
Labor	230	217	166	247	208	219	217	261
Total Costs	2,112	1,995	1,746	2,101	1,858	2,039	1,805	1,882
Income (Loss)	(133)	(33)	21	(325)	(92)	(248)	(31)	(8)

Source: <https://frazerllp.com/wp-content/uploads/2019/01/06.30.18-DOT.pdf>

Monthly Milk Price Western States



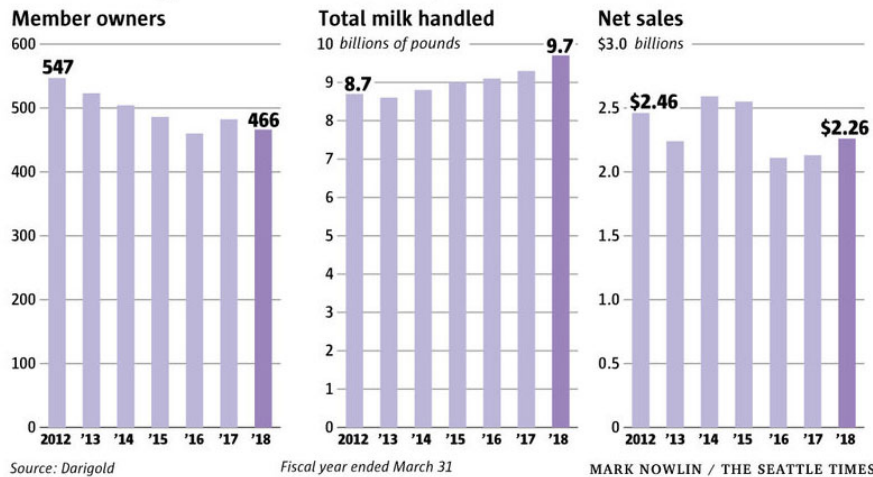
Increasing Exports Increase Price Risk

Darigold aims to sell more than half of its dairy output abroad despite trade spat

Originally published August 20, 2018 at 6:00 am | Updated August 20, 2018 at 8:16 pm

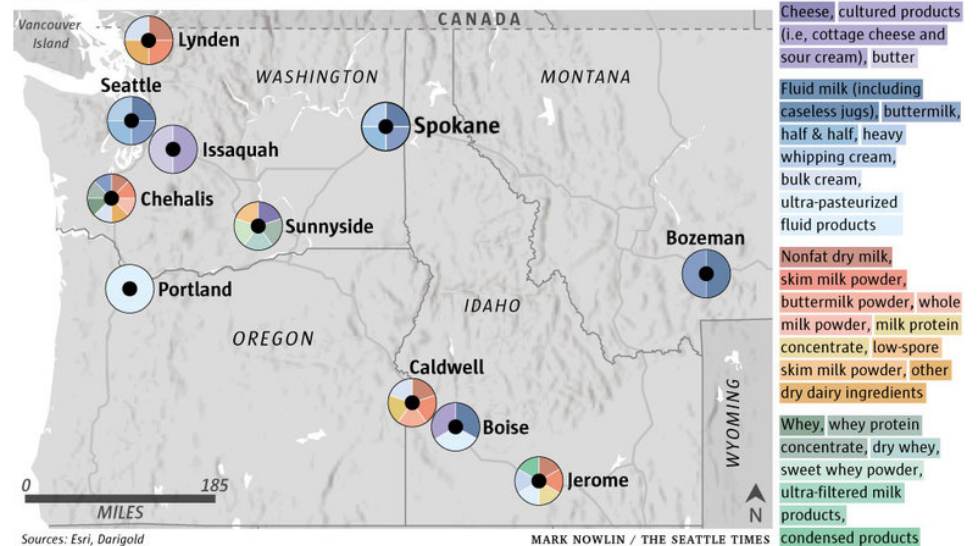
Darigold members, milk volume and net sales

Darigold is handling more milk from fewer farmers as it expands its export business and weathers a long period of low domestic milk prices.



Darigold processing plants

Raw milk from 466 member-owner farms is turned into more than two dozen dairy products at 11 Darigold processing plants around the Northwest.



Life Cycle Assessment of Milk

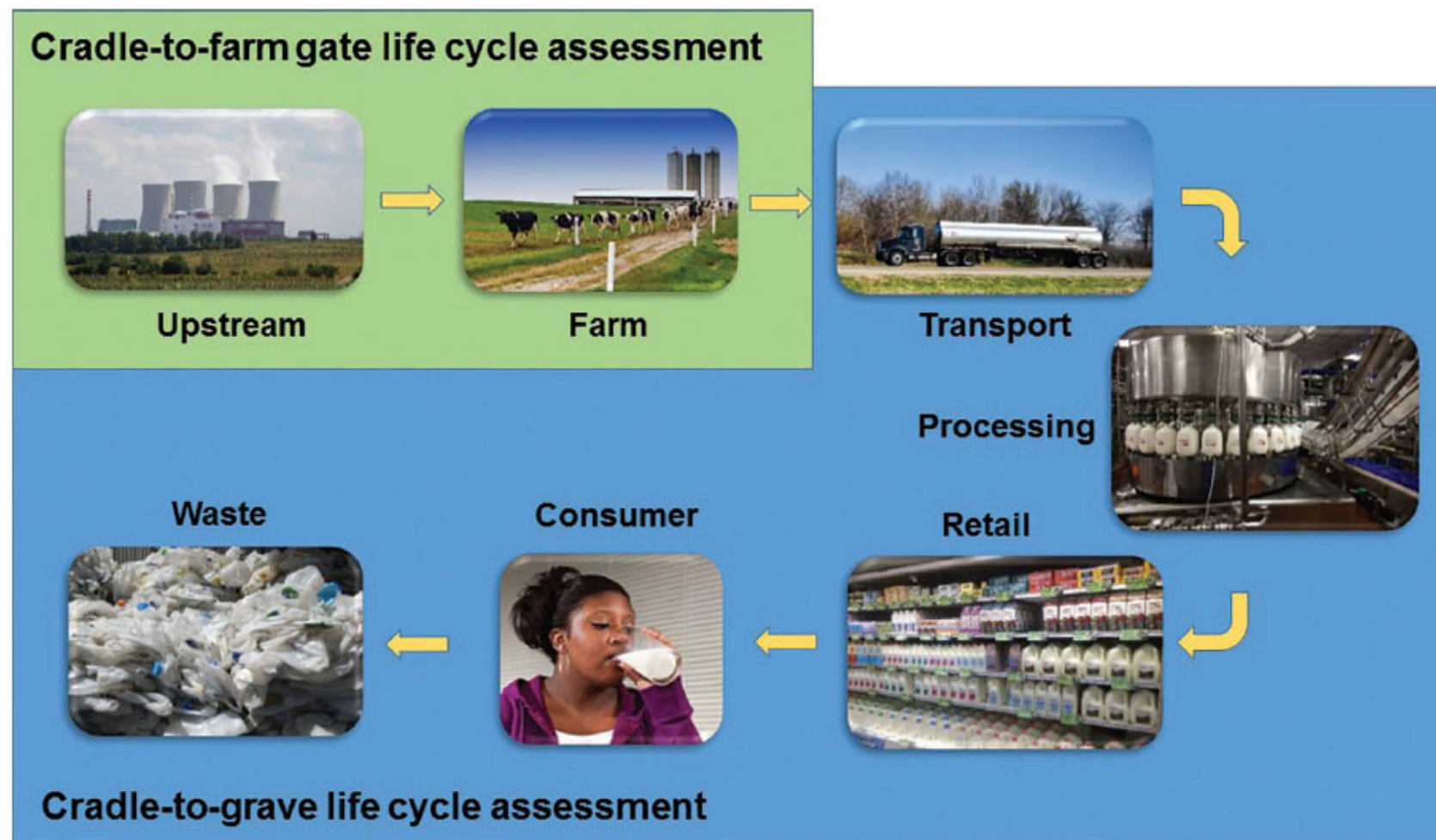
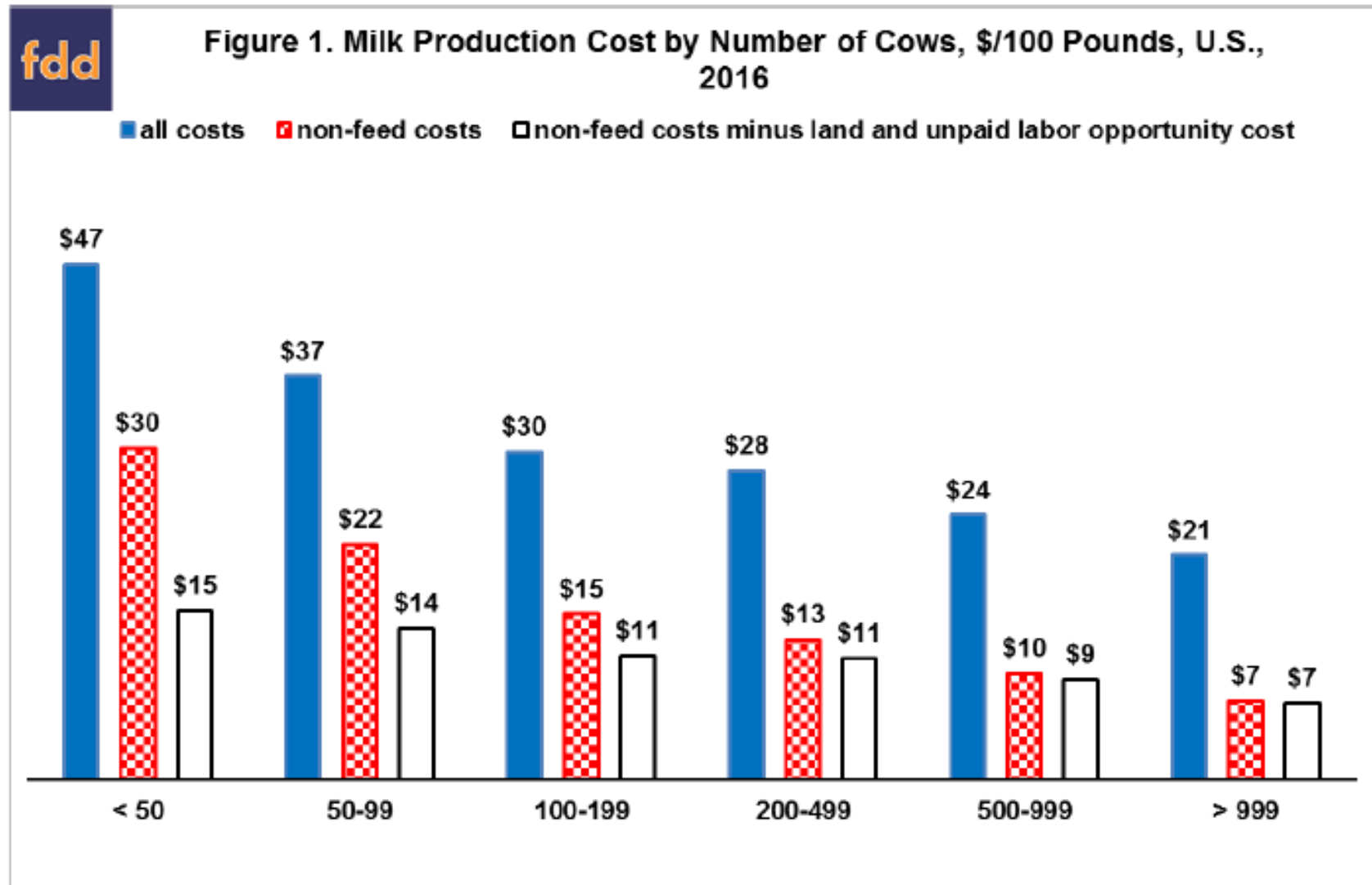


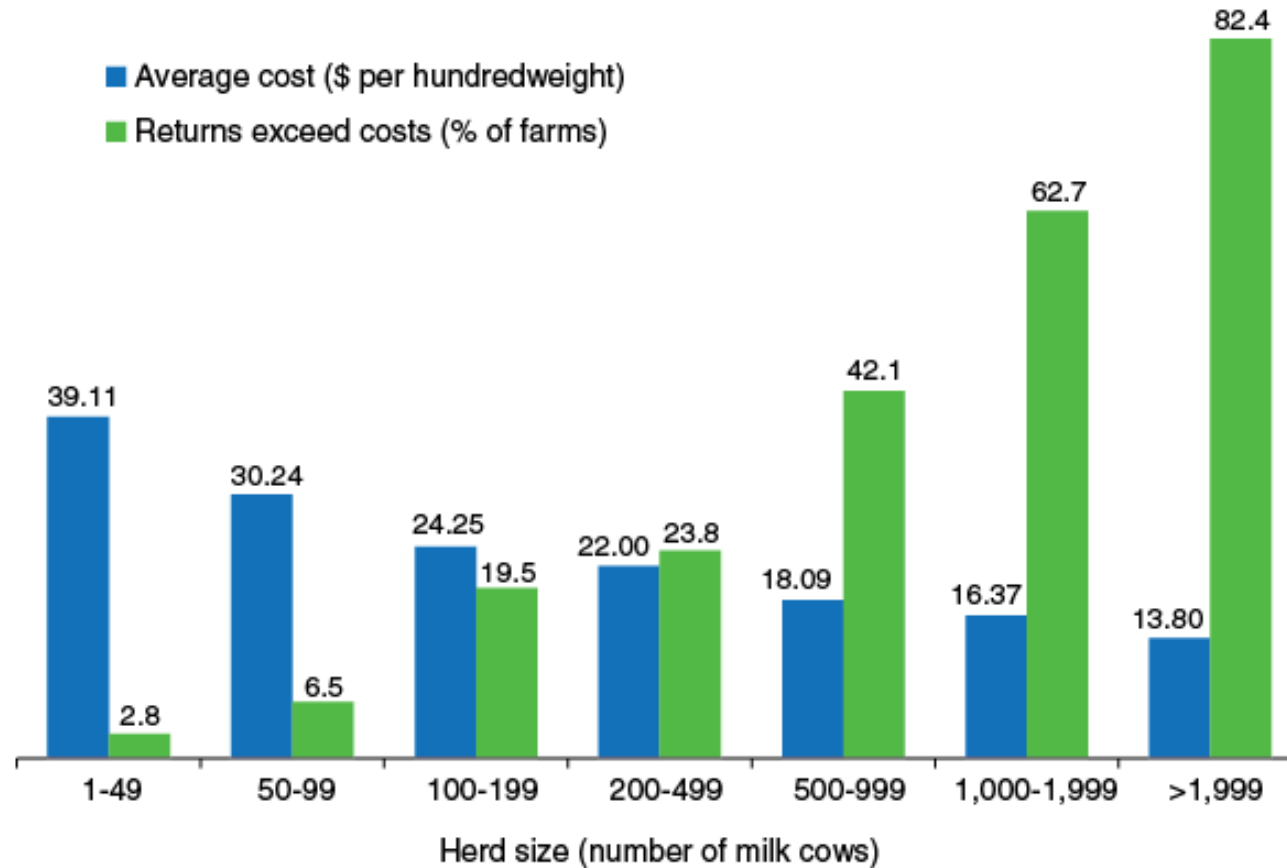
Figure 1. Major components considered in a life cycle assessment of milk. Processing photograph provided by Dairy Management Inc. (Rosemont, IL); waste image provided, unaltered, through a Creative Commons CC BY 2.0 license by Sustainable Initiative Inc. (<http://www.flickr.com/photos/siftnz/4661013805>).

Economies of Size - 1



Economies of Size - 2

On average, larger dairy farms realize lower costs and higher profits



Source: USDA, Economic Research Service using USDA, National Agricultural Statistics Service, Agricultural Resource Management Survey (ARMS).

Changing Dairy Conditions



United States Department of Agriculture

Economic
Research
Service

Economic
Research
Report
Number 205

March 2016

Changing Structure, Financial Risks, and Government Policy for the U.S. Dairy Industry

James M. MacDonald

Jerry Cessna

Roberto Mosheim

Table 8

Effects of structural change on industry average cost by herd size, 2010

Herd size (milk cows)	Average cost, 2010	Shares of production (%)		
		1998	2010	2012
<50	\$39.11	10.5	4.6	4.2
50-99	\$30.24	20.9	10.4	9.5
100-199	\$24.25	17.9	11.3	10.7
200-499	\$22.00	16.9	12.7	12.6
500-999	\$18.09	12.6	13.0	12.4
1,000-1,999	\$16.37	11.9	15.5	15.9
>1,999	\$13.80	9.3	32.5	34.7
Industry average cost	\$24.00	\$19.85	\$19.52	

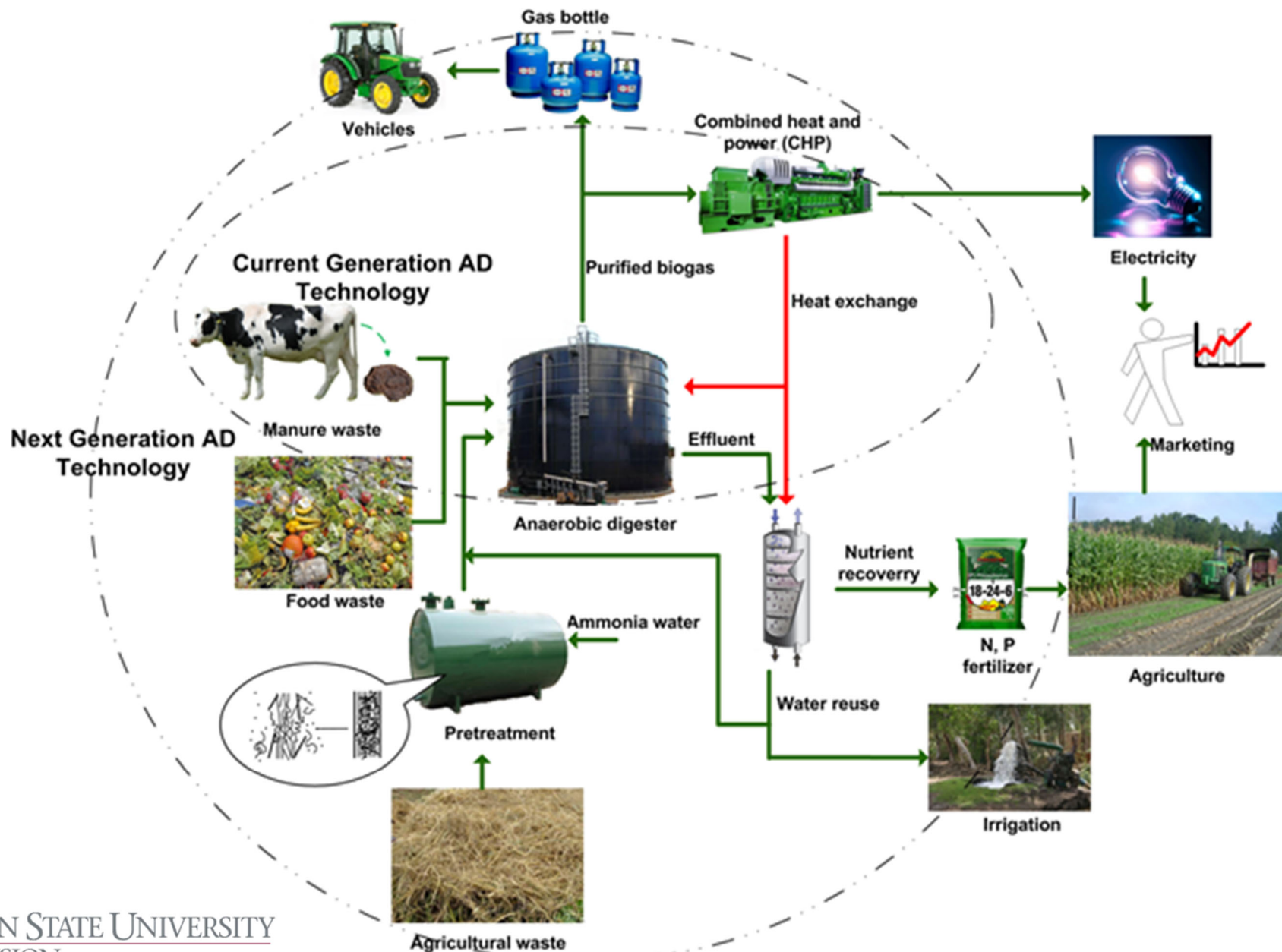
Sources: Average costs by size class: ERS estimates derived from USDA, 2010 Agricultural Resource Management Survey, version 4. Production shares: USDA National Agricultural Statistics Service, *Milk Production*, February 2000 (1998 data), and *Farms, Land in Farms, and Livestock Operations* (2010 and 2012 data).



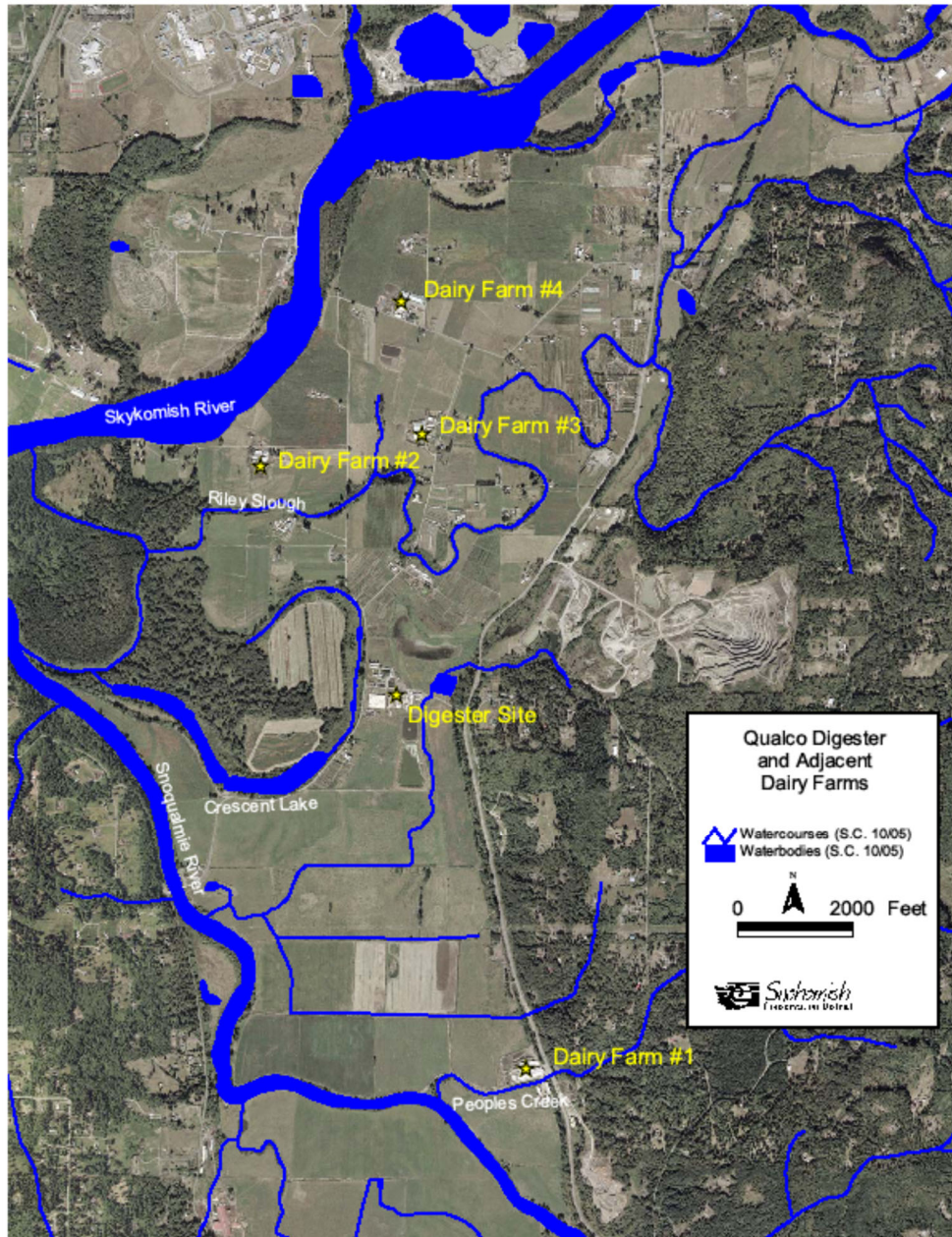
Dairy Financial Risk Discussion Points

- Economies of size pushing towards larger dairies
- Increasing leverage (debt) on dairies
 - Operating losses, replacements and capital investment
 - Optimal Debt / Asset ratio “greater than 60%”
 - Objective to become “too large to fail”
 - 3,000 cows about \$30 Million Asset
- No crop land in Dairy balance sheets
- Dairy is the high risk ag portfolio for Ag Banks
 - Declining value as an acquired property
 - Difficulty in obtaining new milk contract for expansion
- Financial management objective to minimize taxes

Comparison between the current (oval circle) and proposed next generation AD technologies (larger circle)



Inner Circle Modeling Results



Qualco Anaerobic Digester Project Site

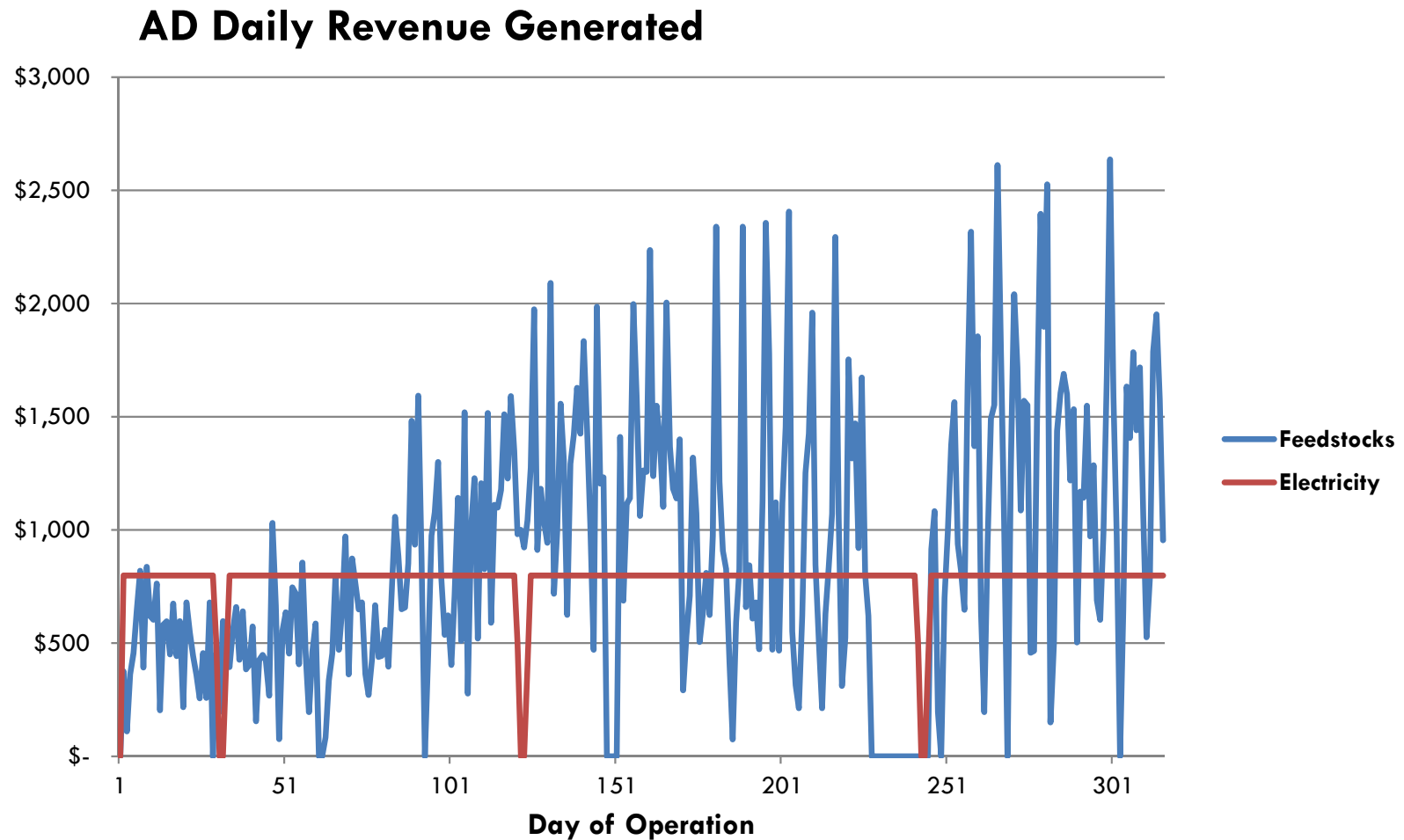


The Qualco AD and Receiving Packing Plant Blood Waste



Revenue Distribution

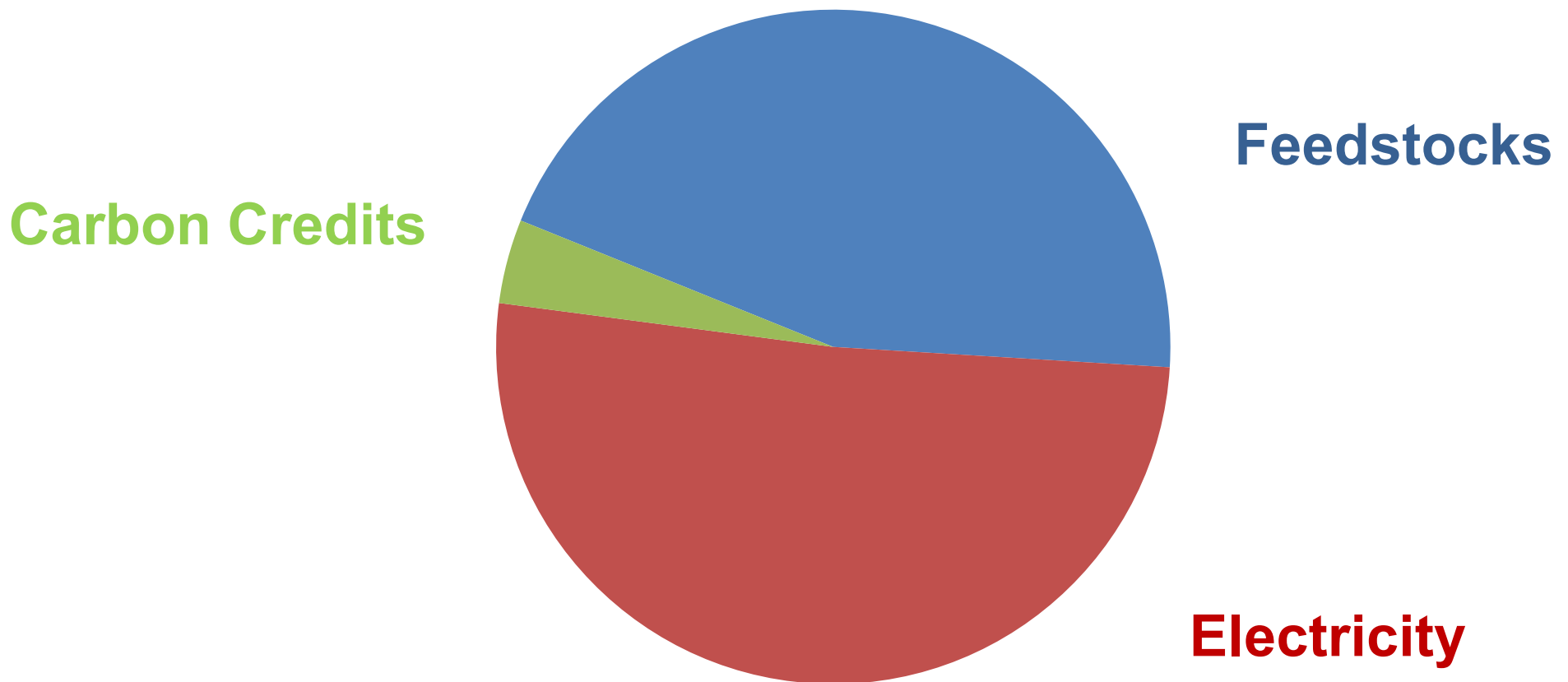
AD Daily Revenues



Annual Revenue Distribution

AD Model Revenues Total Revenue is \$545,514

AD Modeled Revenue Sources



Current ADOPT Modeling Efforts

- Endogenous formulas to convert manure and feedstocks into:
 - Nutrient balance
 - Biogas potential
 - Conversion of biogas into electricity
 - Conversion of biogas into purified natural gas
- Pricing feedstock tipping fees based on nutrients and biogas potential relative to capacity constraints
- Modeling nutrient balance (N and P) and application field soil tests and effluent applications

Discussion and Questions

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509 335 6360

