The Center of Excellence for Sustainable Food and Agricultural Systems
New Mexico State University
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Opportunities for Value-Added Agriculture Meat Processing

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Rural Economic Opportunities Task Force
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Take home messages

In our last meeting I heard

- We need a "one-stop" shop for all things related to value-added agriculture.
- Rural communities don't have the expertise to explore value-added agricultural opportunities.
- We need to "fill in the gaps."
- Interested in exploring opportunities with value-added meat processing and controlled environment agriculture.

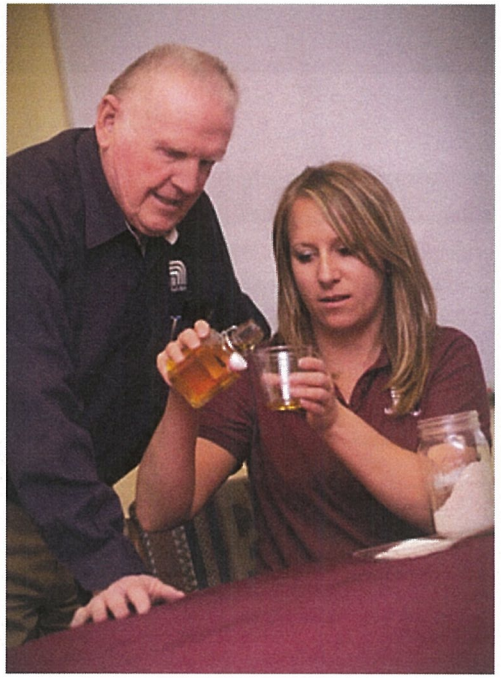
We need a "one-stop shop"

- Many sources of information & available resources, but they are scattered.
- Once reference source.
- Distribution:
  - The Cooperative Extension Service, and
  - NMSU's Farm and Ranch Resource Center website.

New Mexico Rural and Agribusiness Assistance

Numerous organizations can provide business assistance to New Mexico's agricultural and rural businesses. Many of the services provided by these organizations are free or can be obtained at reduced costs. This document provides a summary of organizations that provide business assistance. The document will be updated as new information, and support sources are identified.

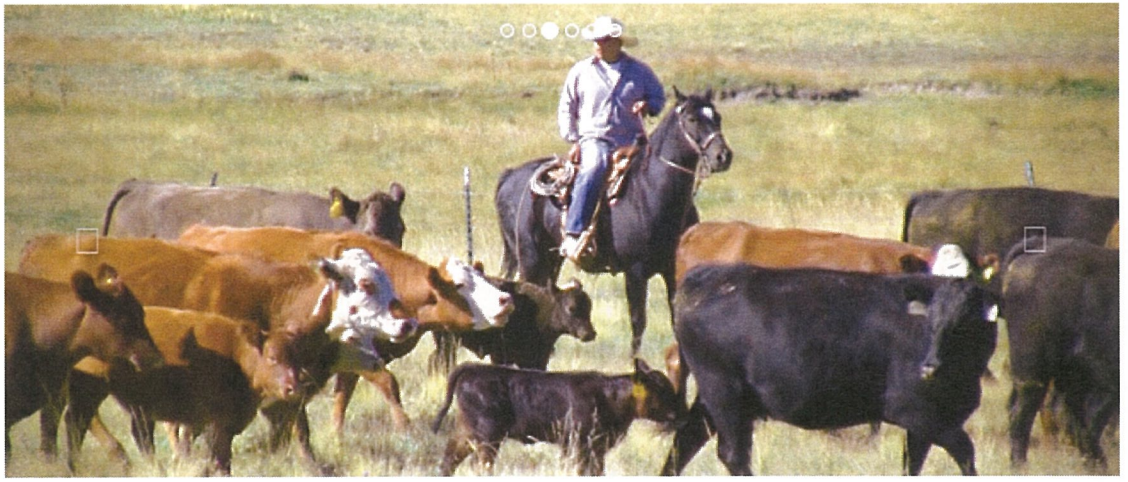
New Mexico State University's Extension Economics Department Extension faculty have attempted to identify reputable organizations and information sources. Neither the faculty nor New Mexico State University warrants the effectiveness of the services provided or the accuracy of information provided. Individuals using the information should verify the accuracy of all information before taking action based on it.



NMSU Farm and Ranch Resource Center

- Web presence
- Links to information

New Mexico
Farm and Ranch Resource Center



Agriculture

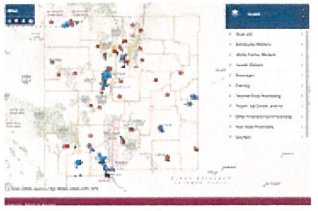
National, State, and County Data · Crops · Livestock · Small Farm and Ranch Sustainability

Resources ▸

Food

Local and Regional Food Systems · Gardening · Nutrition, Health and Food Safety

Resources ▸

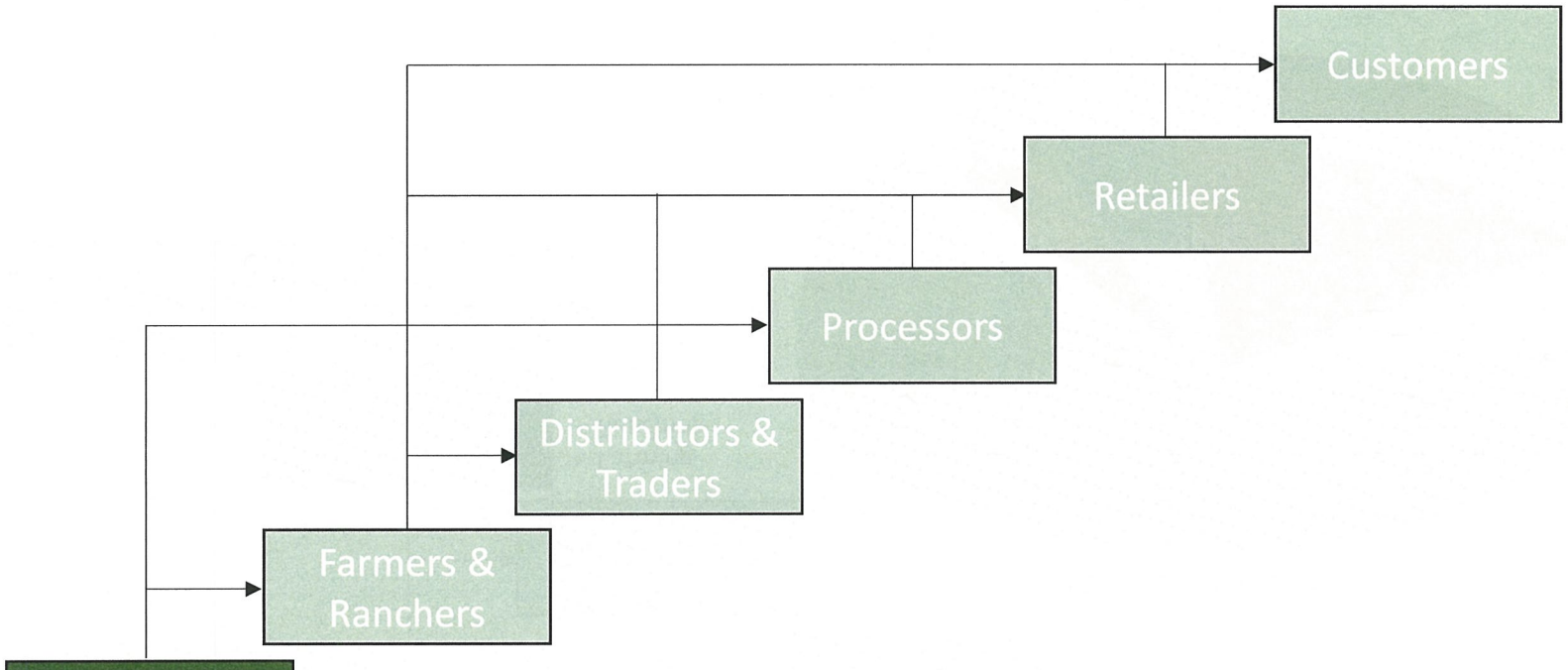


Food Atlas

Locations and contact information for New Mexico businesses in the agriculture and food supply chain.

NM Food Atlas ▸

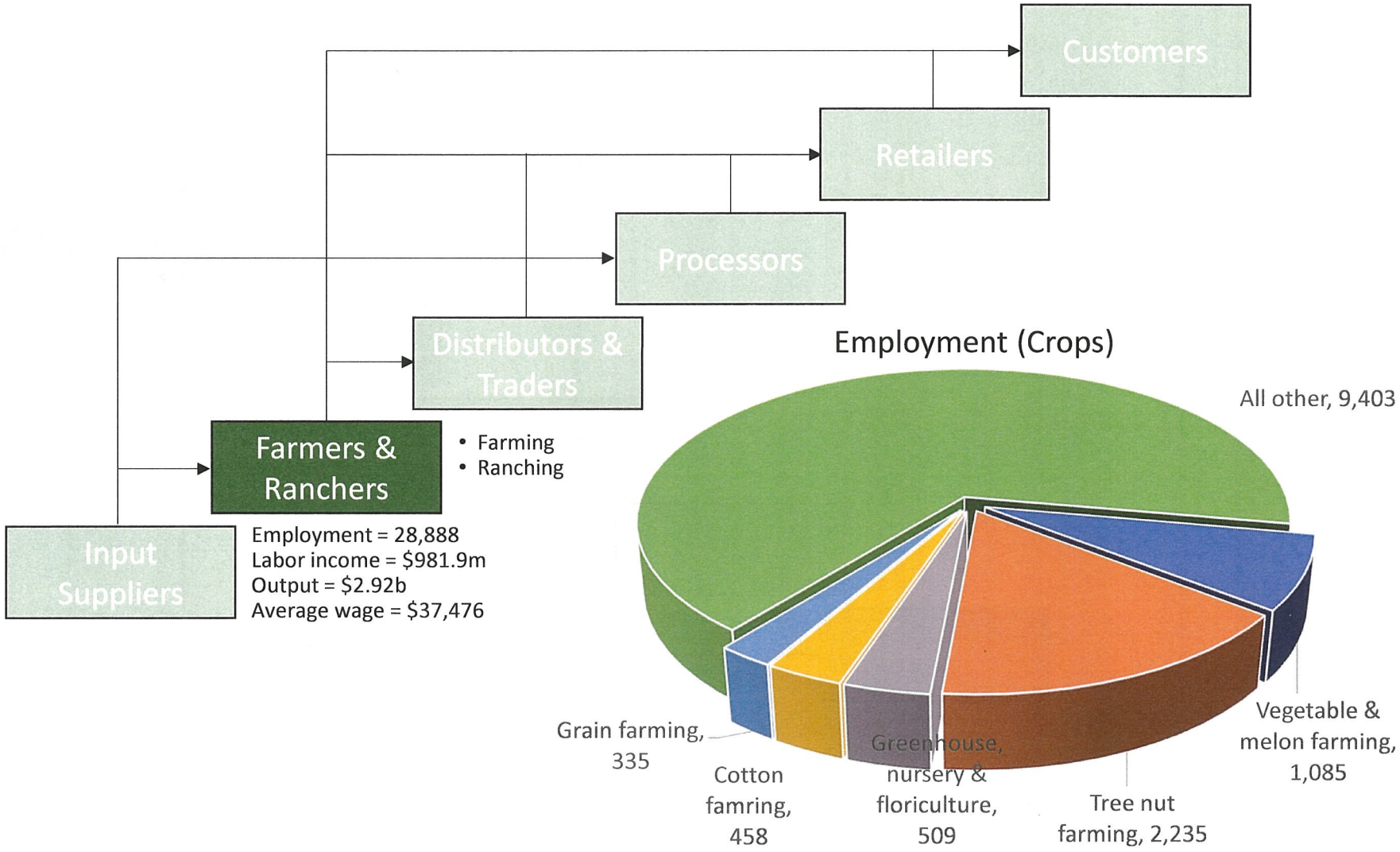
The New Mexico food supply chain



- Support activities for agriculture
- Nitrogenous fertilizer mfg
- Phosphatic fertilizer mfg
- Fertilizer mixing
- Farm machinery & equipment mfg
- Food product machinery mfg

Employment = 4,768
Labor income = $174.18m
Output = $282.1m
Average wage = $69,216

The New Mexico food supply chain



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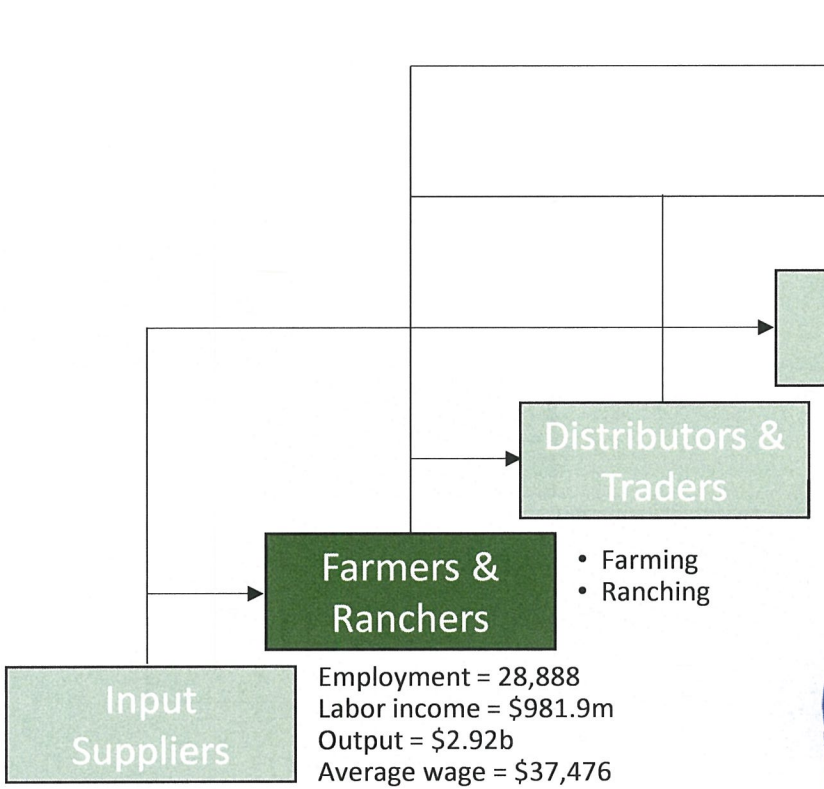

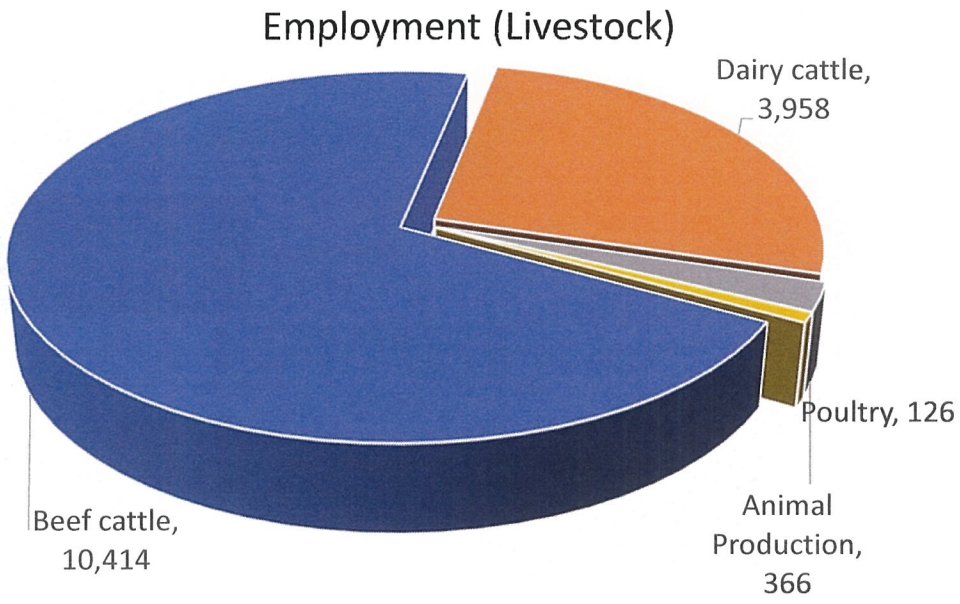

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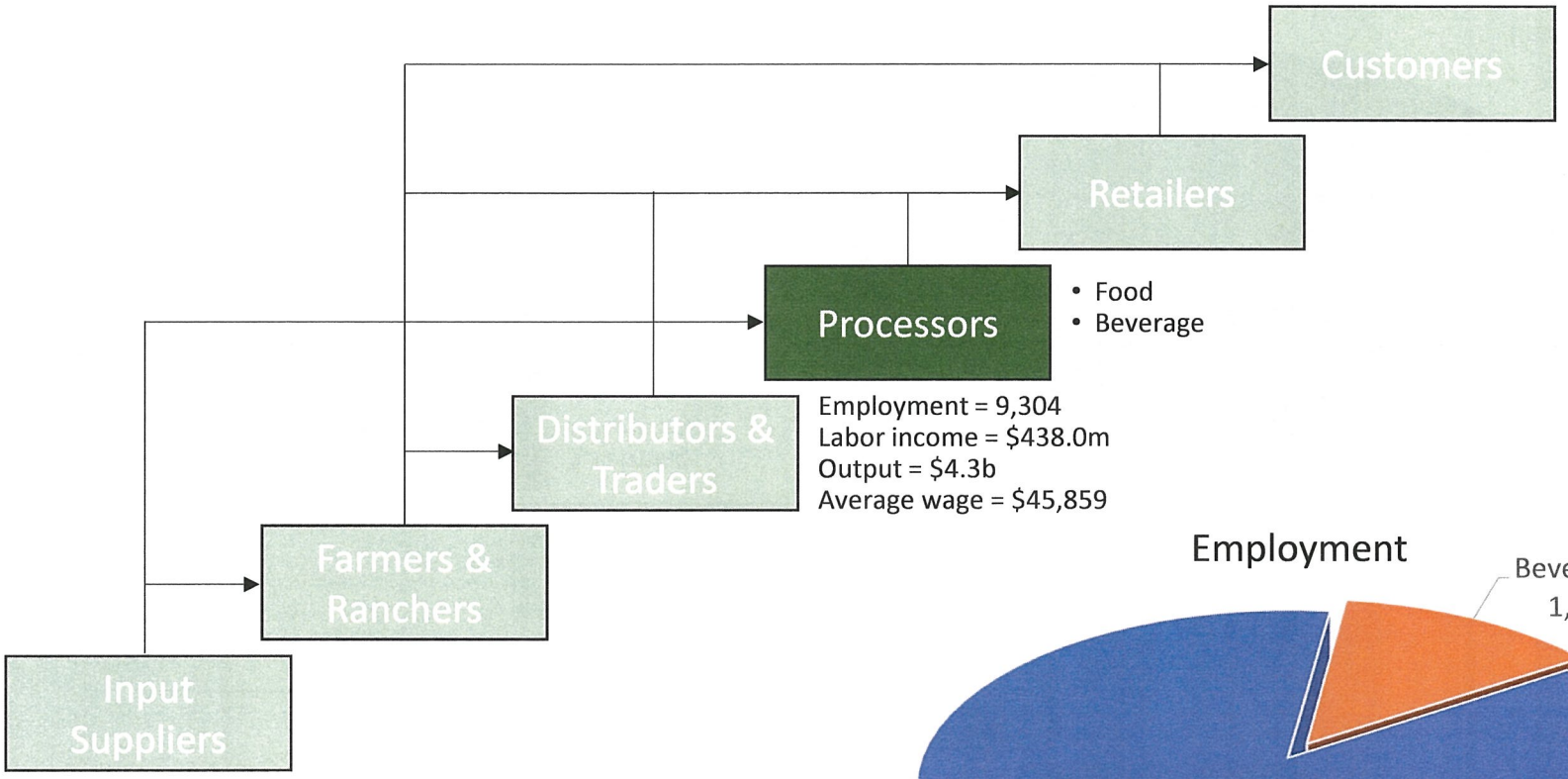

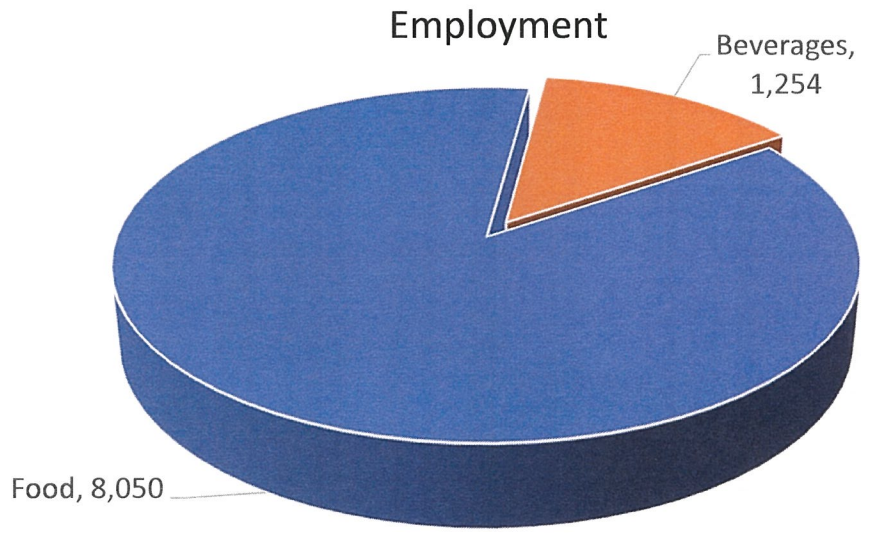

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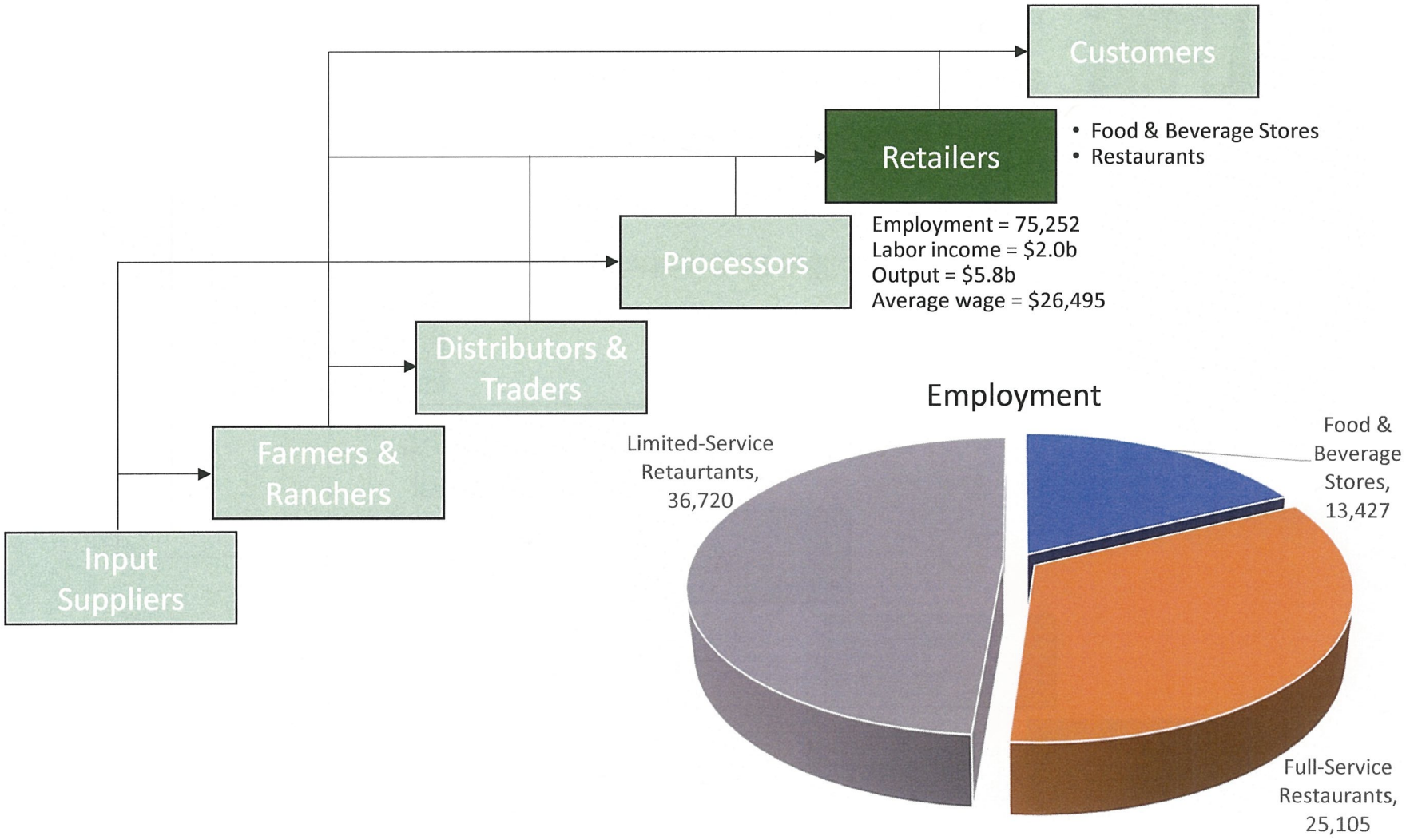

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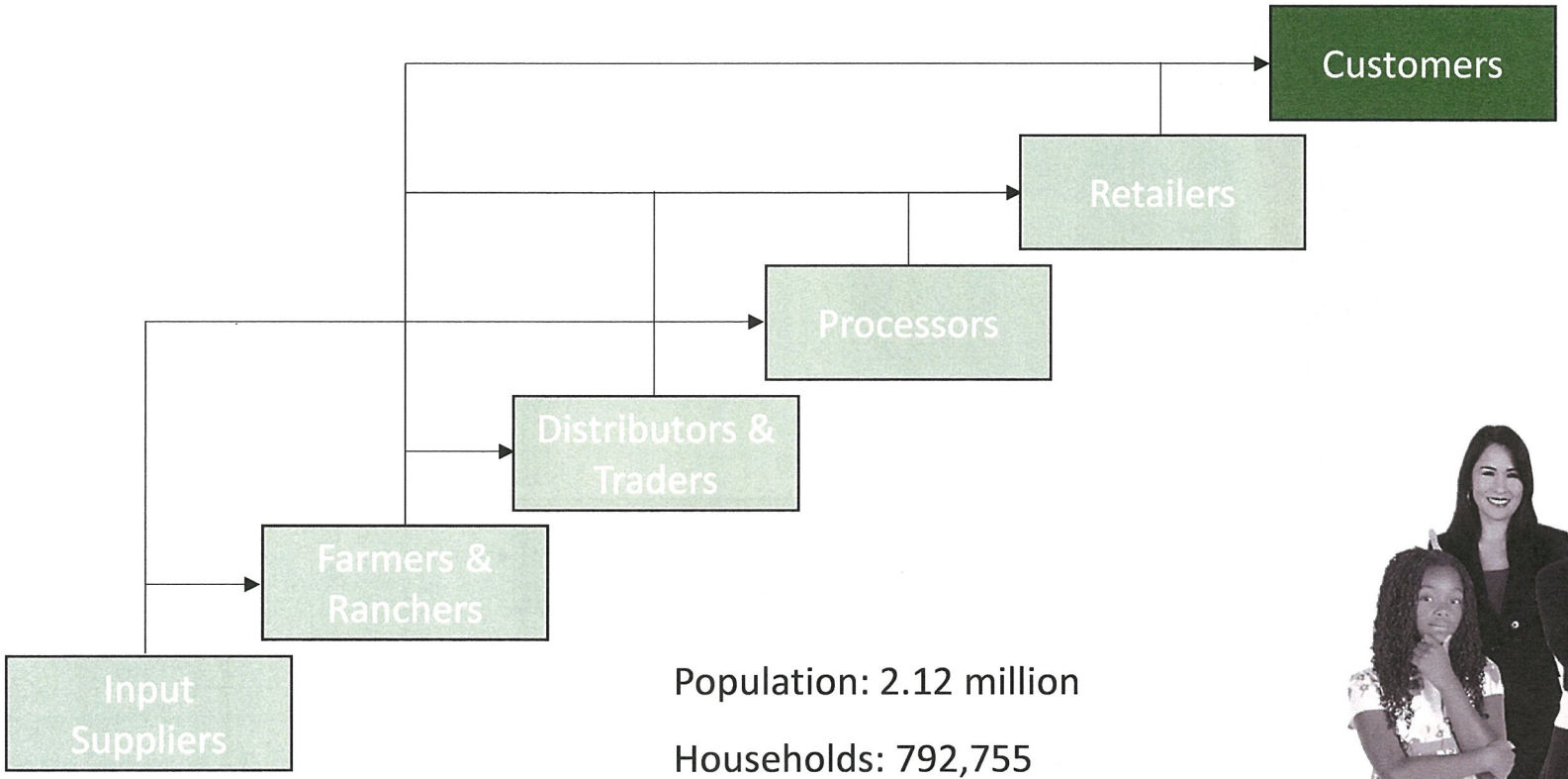


Population: 2.12 million

Households: 792,755

In civilian labor force: 56.9%

Median household income: $51,243

Source: U.S. Census, 2021

Value-added agriculture

Value-added agriculture is a broad term that encompasses many different activities throughout the supply chain. At its heart, value-added agriculture is a means of differentiating a homogeneous commodity into a differentiable product.

These might include:

- Breeding plants and animals that have higher nutritional value, e.g., higher in antioxidants, higher fiber content, …
- Processing, e.g., "green" processing and sustainable packaging.
- Information & identity preserved commodities.
- Further processing.

(Sources: AgMRC, N.D.; PSU Extension, 2016; Lu and Dudensing, 2015)

Why interest in value added?

2020 Food dollar: Marketing bill (nominal)

Source: USDA-ERS, 2020

Why interest in value added?

Value added = New responsibilities

2020 Food dollar: Industry Group (nominal)

Source: USDA-ERS, 2020

Why interest in value added?

Value added = New responsibilities

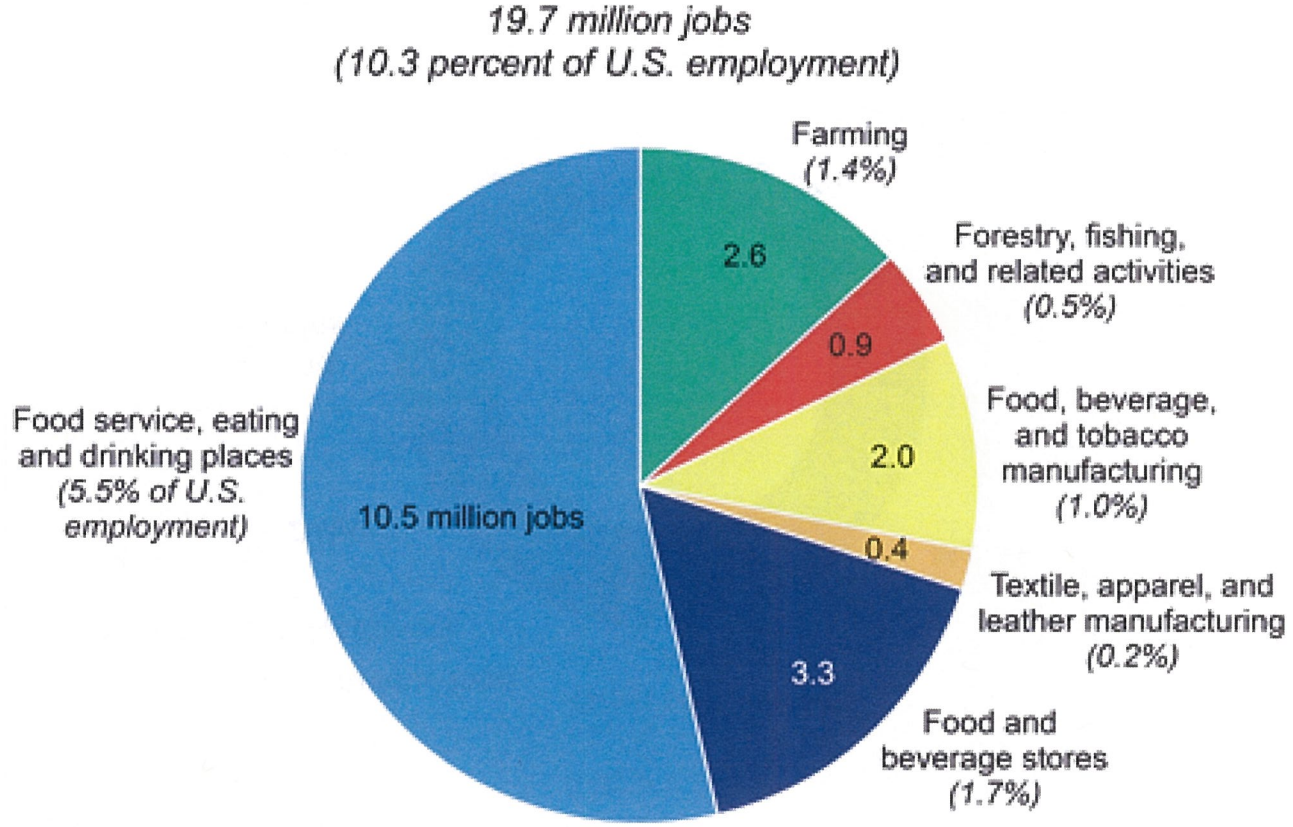
Table 1: Survival and growth rates for direct and non-direct farm

Operation type	Non-direct farm	Direct farm	Difference	Non-direct farm	Direct farm	Difference
Survival rates						
Income level	Beginning farmer			All operations		
$1-9,999	42%	51%	9%	45%	55%	10%
$10,000-49,999	52%	61%	9%	58%	67%	9%
$50,000-249,999	59%	65%	6%	66%	74%	8%
$250,000+	66%	70%	4%	73%	79%	6%
All	47%	54%	7%	55%	61%	6%
Growth rates						
Income level	Beginner farmer			All operations		
$1-9,999	42%	35%	6%	37%	32%	5%
$10,000-49,999	2%	-17%	19%	3%	-12%	15%
$50,000-249,999	15%	-7%	21%	12%	-3%	15%
$250,000+	12%	-10%	21%	12%	4%	8%
All	26%	18%	8%	19%	14%	6%

Source: Trends in U.S. Local and Regional Food Systems

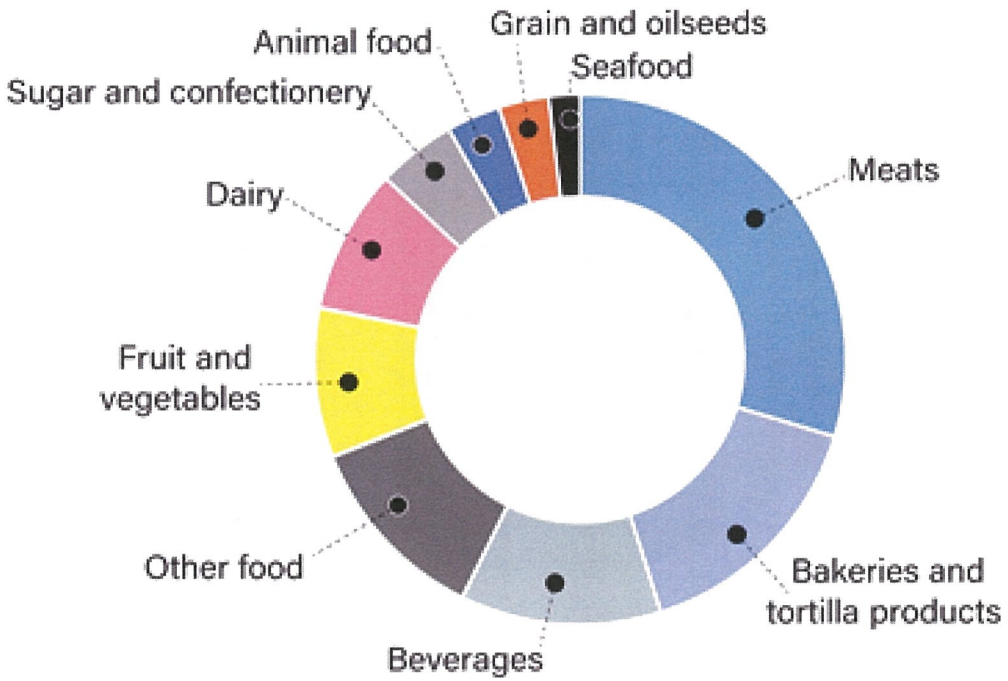
Source: USDA-Risk Management Agency, 2021

Employment* in agriculture, food, and related industries, 2020



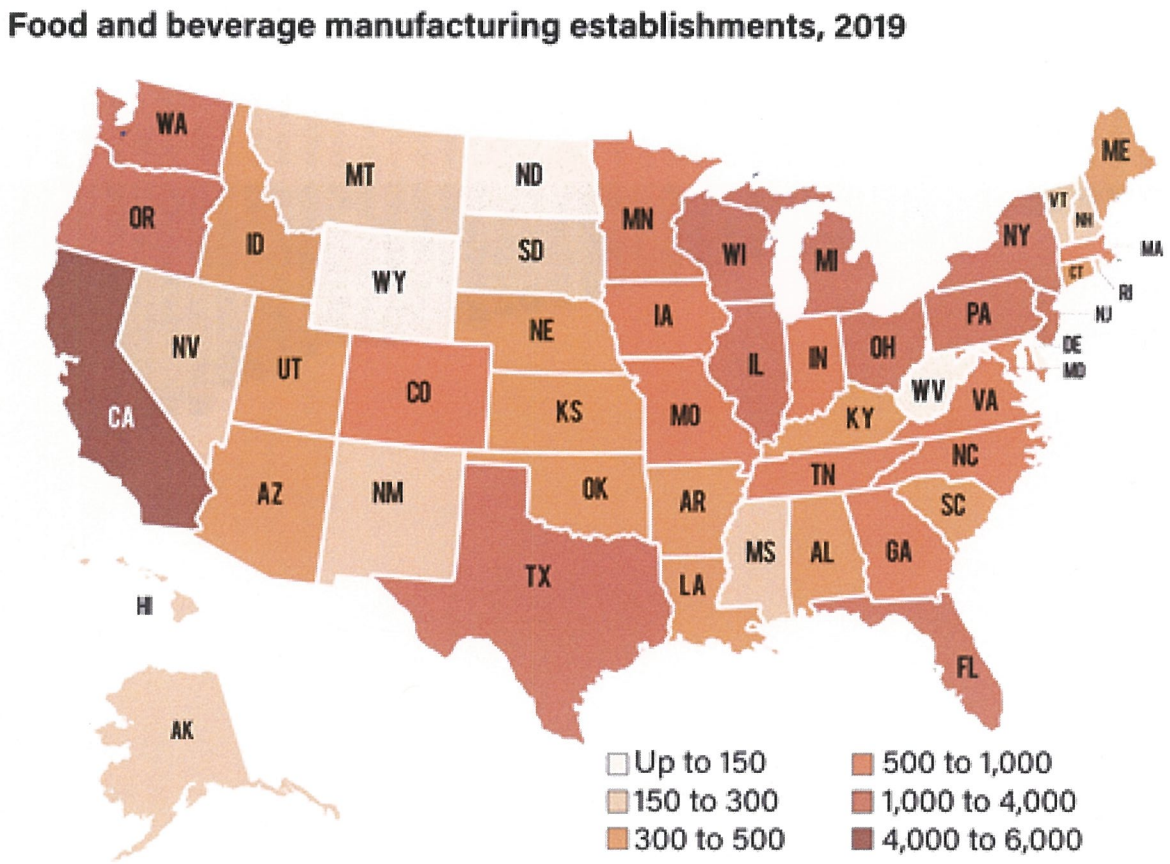
Source: [USDA – Economic Research Service]

Food and Beverage manufacturing in 2019 accounted for 14.7% of all U.S. manufacturing employment



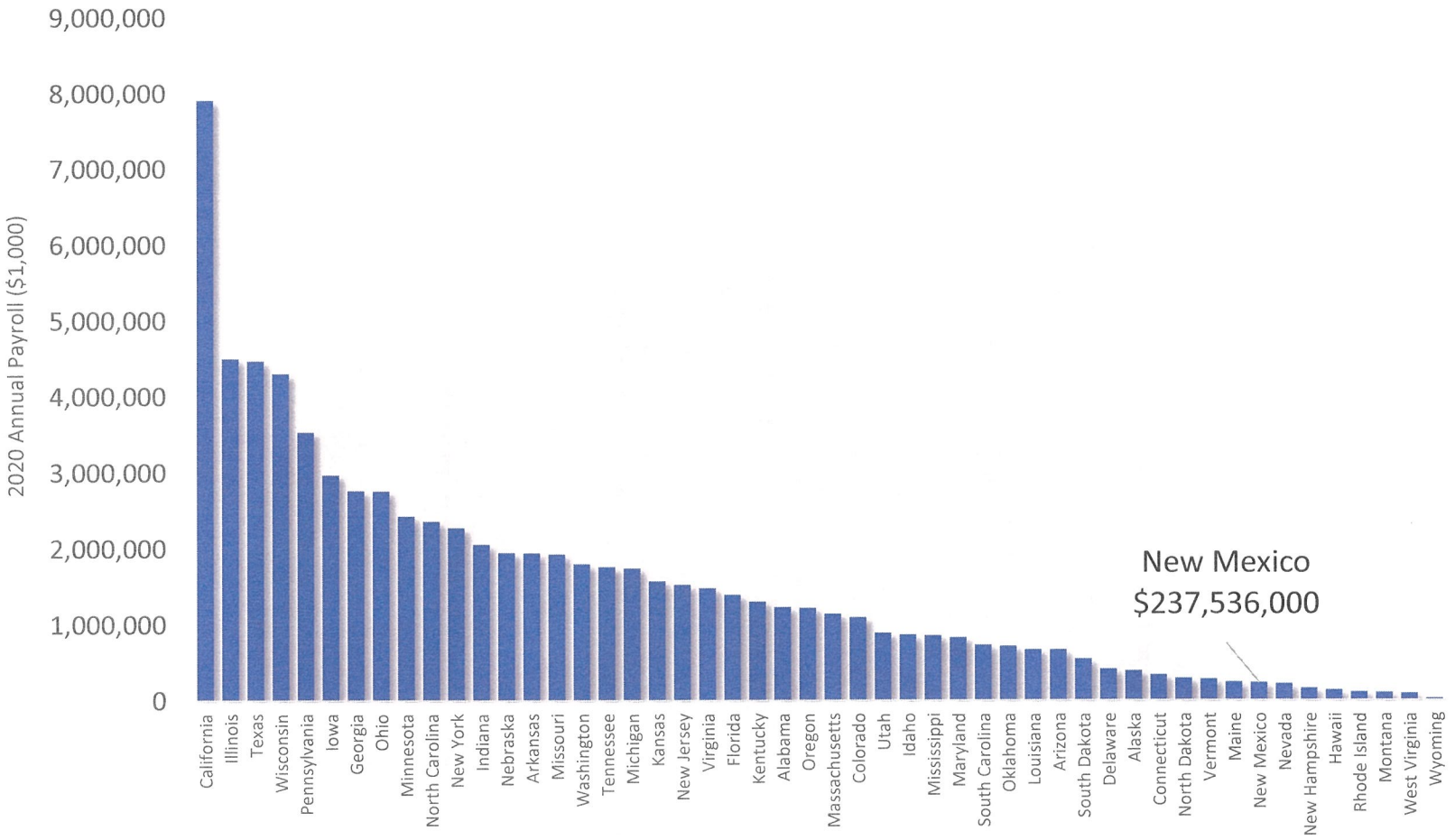
Source: USDA – Economic Research Service

Food and beverage manufacturing by state



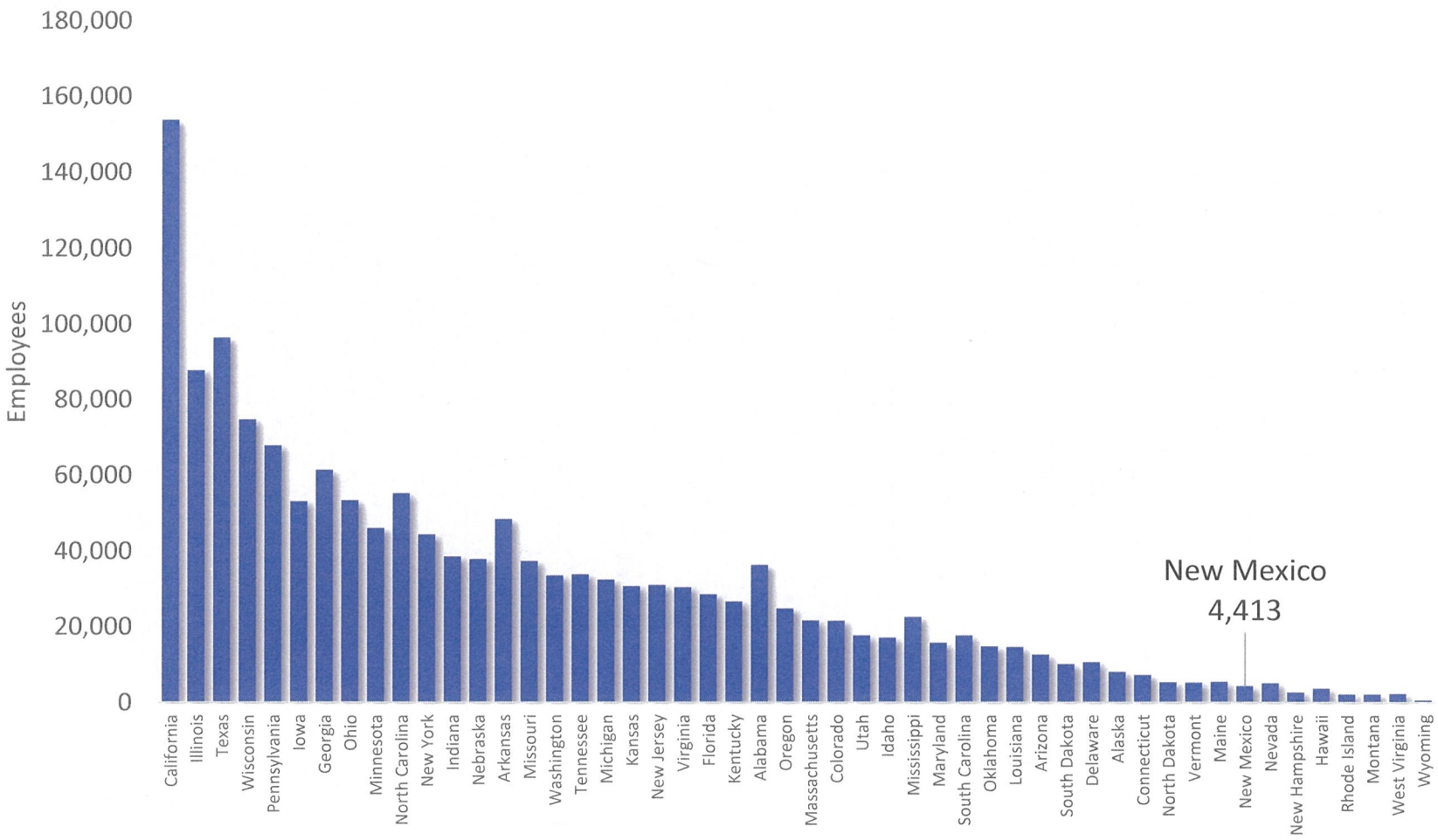
Source: [USDA – Economic Research Service]

Food and beverage manufacturing payroll, 2020



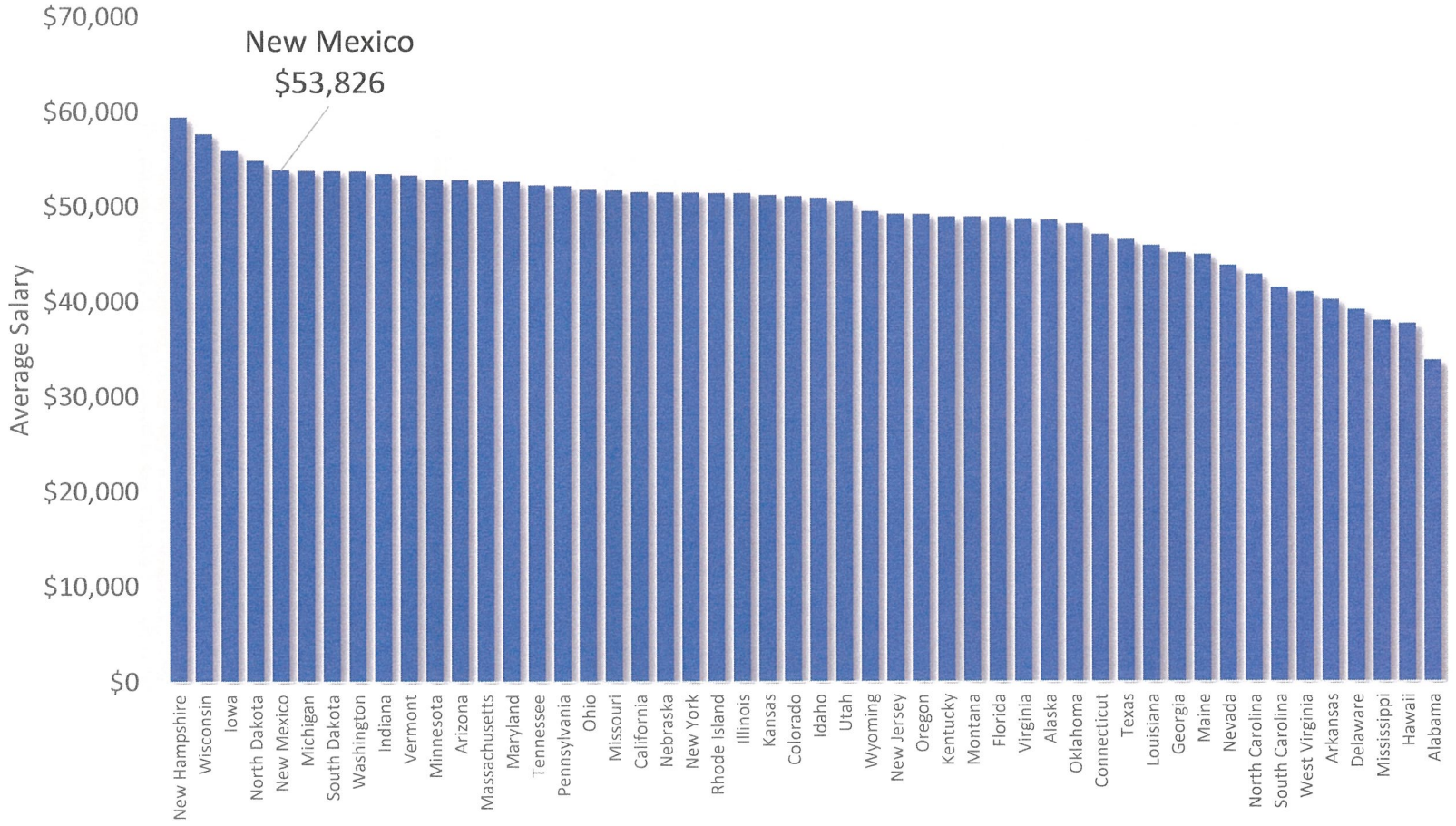
Source: US Census Bureau Annual Survey of Manufacturers

Food and beverage manufacturing employment, 2020



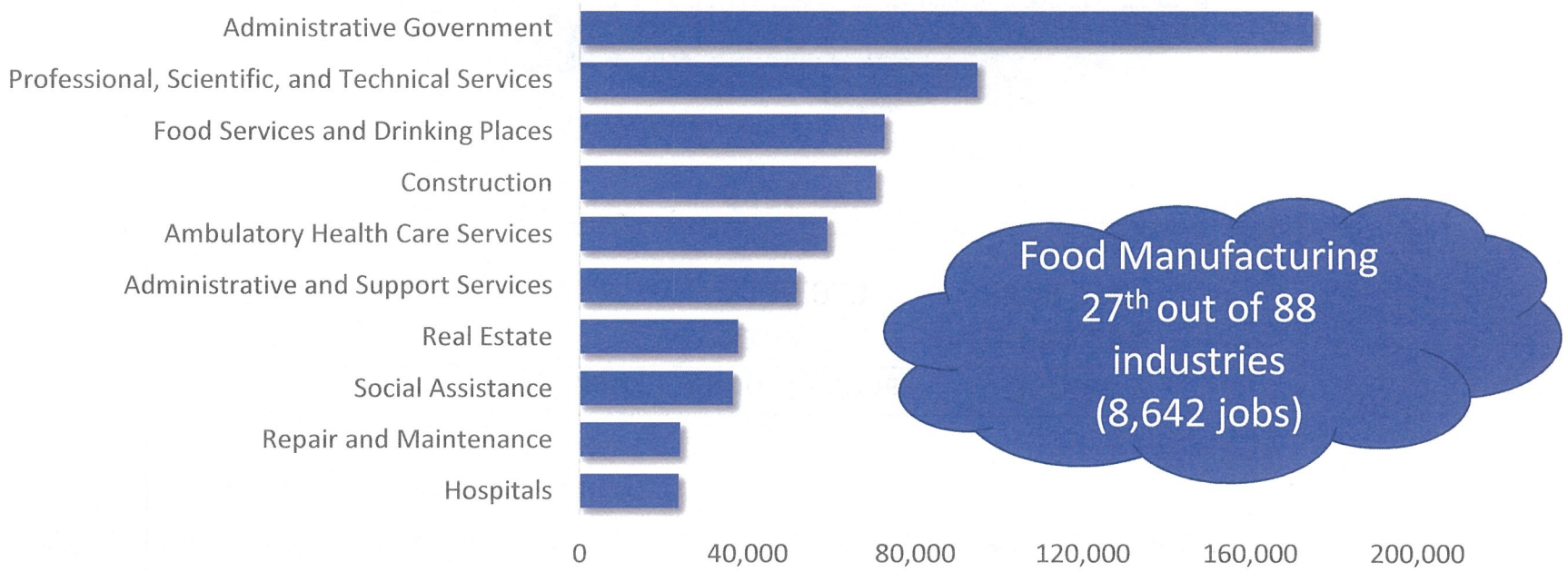
Source: US Census Bureau Annual Survey of Manufacturers

Average food and beverage manufacturing salary, 2020



New Mexico summary (2020)

- GDP = $105.1b
- Personal income = $96.6 billion
- Population = 2,118,882
- Households = 817,092
- Employment = 1,080,855
- Top Ten Industries by Employment (NAICS 3-Digit)



Source: IMPLAN, 2020

Potential economic impact of food manufacturing in New Mexico

What is the impact of adding a food manufacturing firm with $1,000,000 in annual sales?

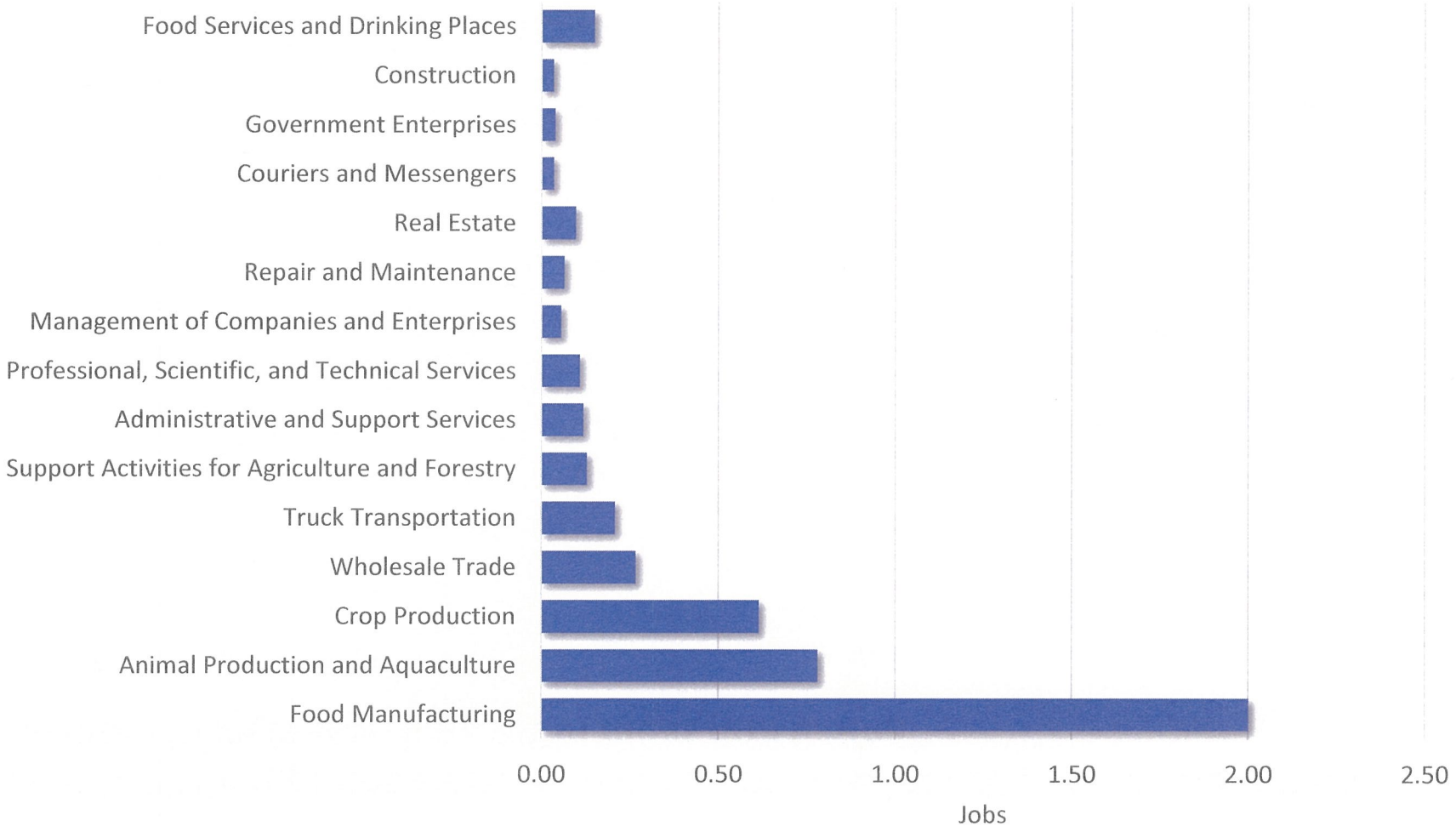
	Employment	Labor Income	Output
Direct	1.9	$102,731	$1,051,264
Indirect	2.6	$125,033	$428,796
Induced	1.0	$43,913	$142,329
	5.5	$271,677	$1,622,389

Source: IMPLAN, 2020

For every 1.9 manufacturing jobs we bring to the state, we support an additional 3.6 jobs in other industries.

Employment multiplier = 2.89

What industries in New Mexico are impacted by growth in the food manufacturing industry?



Source: IMPLAN, 2020

Interest in meat processing

COVID-19 disruptions along with concerns over industry concentration has resulted in increased interest in **meat processing**

Interest in meat processing

Ward et al. (2020)

Explore the feasibility of a very small scale meat processing facility (maximum capacity of 750/year) in Utah.

- An investment of $1.4 million
- The internal rate of return is 8.2%
- Can be feasible but would require that beef is sold and positioned as a premium product.
- There is the possibility of negative returns with lower premiums or other assumptions,

Source: Ward, et al., 2020

Interest in meat processing

USDA Risk Management Agency (2021)

Macro-view of meat processing

- Number of small processing facilities has decreased by nine percent since 2000.
- Local meat marketing prices are significantly higher than larger processors ("commodity meat").
- Gwin et al., (2013) found that processors who marketed beef locally spend $65,446 in marketing costs per 20 animals compared to $38,981 for beef marketed as a commodity.

Source: USDA-Risk Management Association, 2021

Interest in meat processing

Table 2: Beef supply chain costs, local (direct to retail) versus commodity

Local	Pounds	Cost/lb.	Cost	Share of final
Beef	13,200	$2.10	$27,720	42%
Livestock trucking			$350	1%
Processing (62% carcass to meat yield)		$0.65	$8,580	13%
Subtotal	8,184		*$36,650*	
20% margin for marketing and distribution	8,184		$9,163	14%
30% margin for retailer	8,184		$19,634	30%
Total			**$65,446**	
Average retail price/lb.			$8.00	
Commodity	**Pounds**	**Cost/lb.**	**Cost**	**Share of final**
Beef	13,200	$1.85	$24,420	64%
Livestock trucking	13,200	$0.02	$264	1%
Processing (62% carcass to meat yield)	8,184	$0.00	$0	0%
Distribution	13,200	$0.15	$1,980	5%
Subtotal			$26,664	
30% margin for retailer			$11,427	30%
Total			$38,091	
Average retail price/lb.			$4.65	

Source: Local Meat and Poultry Processing
The Importance of Business Commitments for Long-Term Viability

Source: USDA-Risk Management Association, 2021

Interest in meat processing

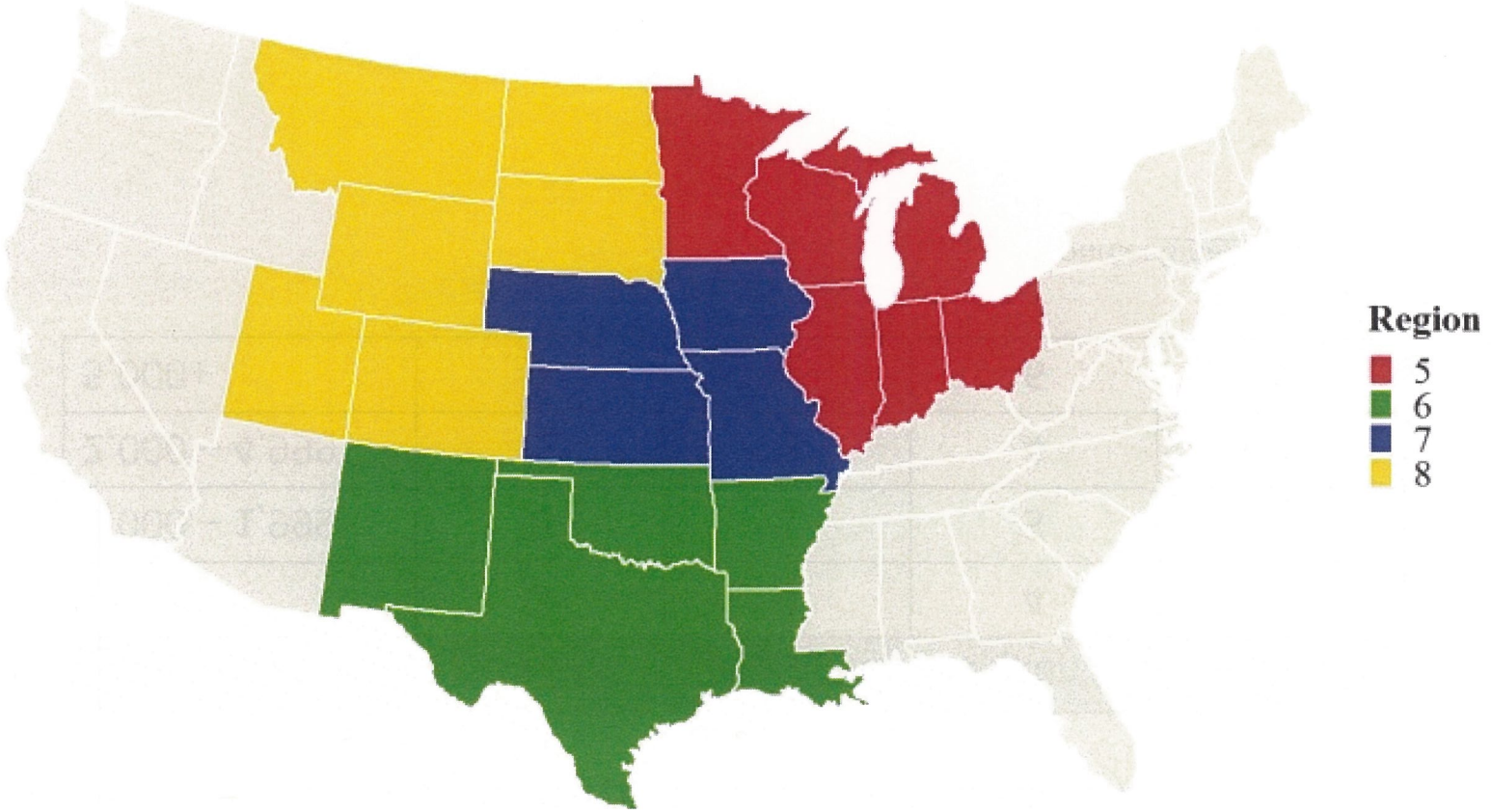
Bina et al., (2022)

Explored beef processing during COVID-19 and the impact of regional reliance on large processing facilities.

- Industry experience substantial reductions early in the pandemic.
- Reductions were similar across different regions of the U.S.
- "If additional physical capacity is added to the industry, it may not provide the widely-stated benefit of increased 'resiliency'."
- Limited evidence of tradeoff between efficiency (size) and resiliency.
- Other issues at play, e.g., switch between food service and retail distribution channels

Source: Bina, et al., 2022

Interest in meat processing



Source: Bina, et al., 2022

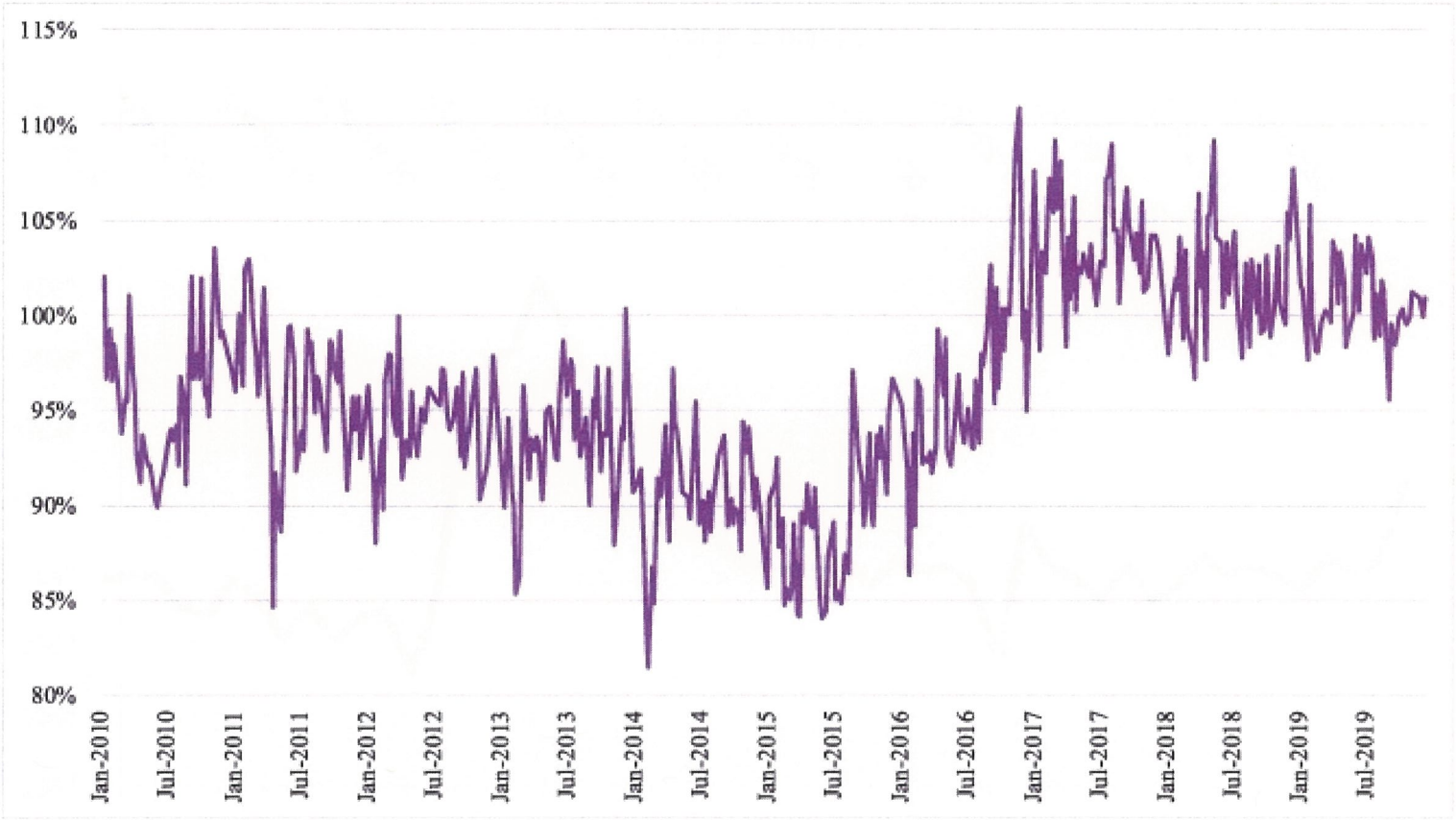
Interest in meat processing

Number of beef processing plants, by size and region

Daily capacity	Region 5	Region 6	Region 7	Region 8
<1,000	3	0	4	1
1,000 – 1,999	0	1	3	1
2,000 – 4,999	1	1	4	2
5,000+	0	2	6	1

Source: Bina, et al., 2022

Interest in meat processing



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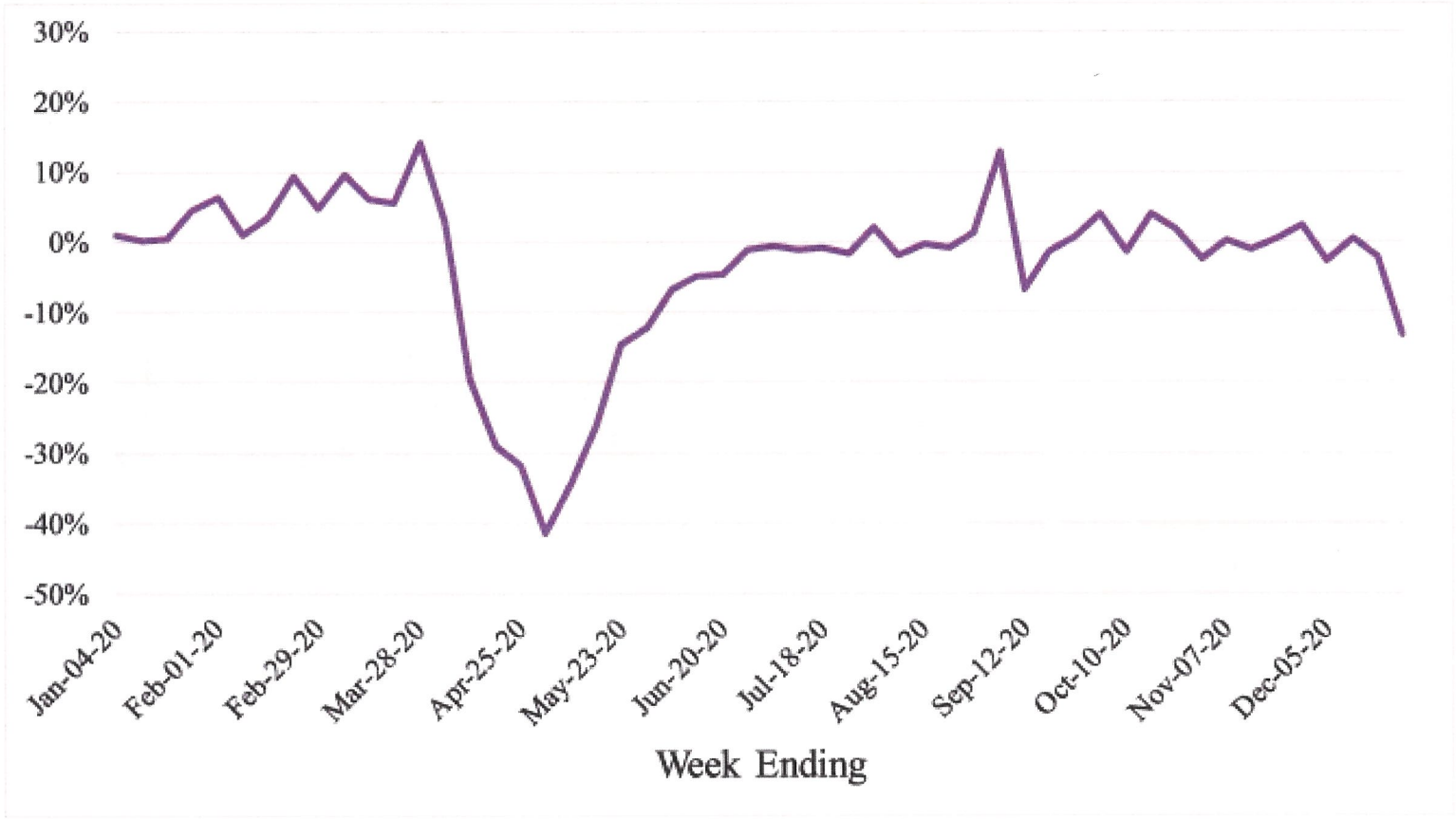

Source: Bina, et al., 2022

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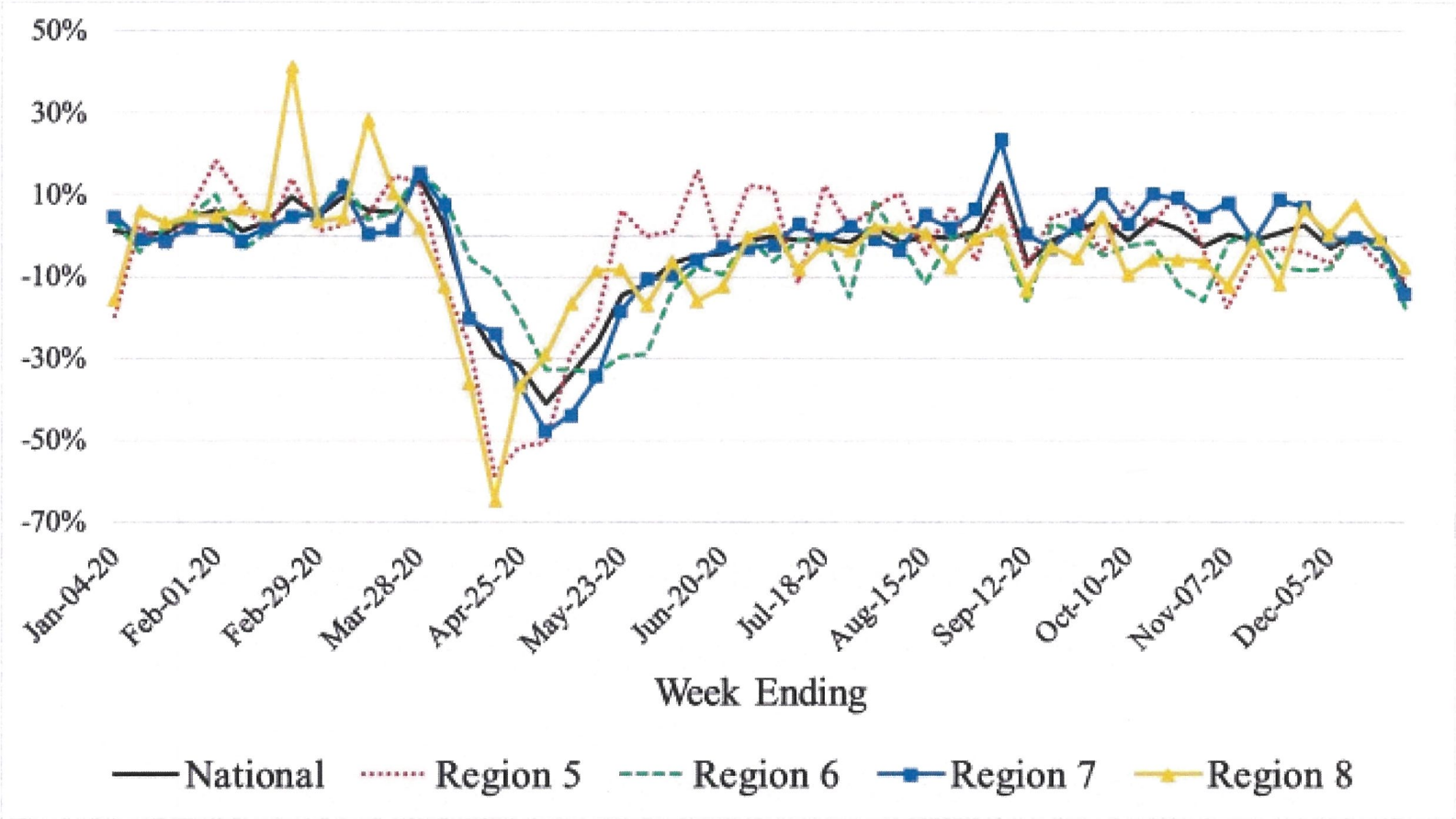


Source: Bina, et al., 2022

Interest in meat processing

Rabinowitz, et al. (2021)

Explored feasibility, marketing, and economic impact of new beef cattle processing in Alabama

- 29 meat processors, 8 federal or state inspected
- Lack of finishing capacity was identified as number one barrier. Other concerns included need for direct marketing, and financial needs.
- Financial analysis for a processing facility that could process 35 beef per week (1,750).
  - Upfront costs = $670,000 to $785,000
  - Operating costs = $700,000
- Need to operate at or near capacity to obtain profits

Source: Rabinowitz, 2021

Interest in meat processing

One Montana (2014)

Explored feasibility of a multispecies processing plant in Montana.

- 250 beef or bison animals daily
- Costs
  - Plant costs $44 million (2014 $)
  - Need a staff of 147-155 people at a wage of $34,919 ($5.4 million)
  - Working capital of $20 million
- Cautions
  - Feasible if "certain steps are taken and critical factors are in place."
  - "Without strong markets for Montana meat products in place prior to construction, the risk involved in building a new plant in Montana would be significantly increased."
  - "… business model that captures value from every part of the animal carcass… necessary to form relationships with existing brands that are willing to purchase many of the products and byproducts not … not destined for the consumer."

Source: One Montana, 2014

Interest in meat processing

Crossroads Resource Center (2021)

Explored feasibility of forming food hubs in Northern Utah, including small meat processing plants.

- Costs of operating food hubs are not trivial, many requiring operating support for decades.
- "It is not clear from our research to what extent meat processing has emerged as a concern among Northern Utah consumers."
- SAPA investment group looked at opening a new meat slaughter and processing operation in a southern county, but the project has been delayed.

Source: Meter, 2021

Interest in meat processing

Emm, et al. (2021)

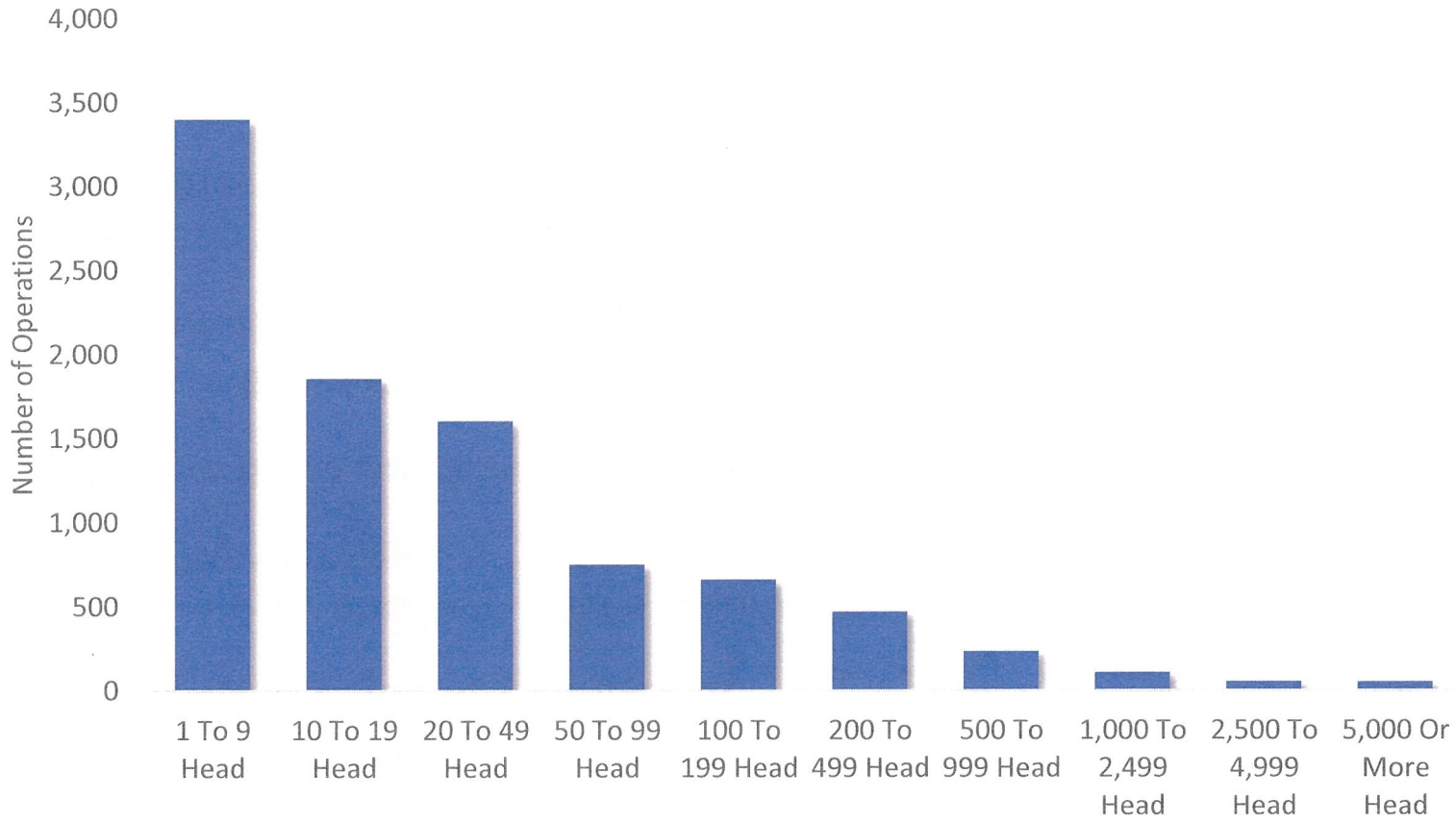
Explored changes in Nevada consumer preferences for local meat resulting from COVID-19 pandemic.

- Low supply and high prices resulted in less fresh meat purchases (13.9% decrease).
- Frozen meat purchases remained unchanged.
- 45% of average Nevada consumers are willing to pay a 30% premium for locally raised ground beef.
- Nevada's limited slaughter and processing capacity means locally produced meat has limited opportunity.

Source: Emm, 2021

New Mexico meat processing challenges

New Mexico is primarily a "cow-calf" state



New Mexico beef cattle farms by size of herd.

New Mexico meat processing challenges

Limited finishing capacity

A study conducted by NMSU in 2020 identified 11 feedlots within the state. Eight owners responded to survey.

- <1,000 (13%)
- $1,000 to 10,000 (50%)
- > 10,000 (37%)

Expansion

- 75% (6/8) of respondents indicated that they could expand their operations by 100 animals per year for sales directly to consumers
- 25% (2/8) of respondents indicated that they could expand more than 1,000 animals per year if their was sufficient demand.

New Mexico meat processing challenges

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New Mexico meat processing challenges

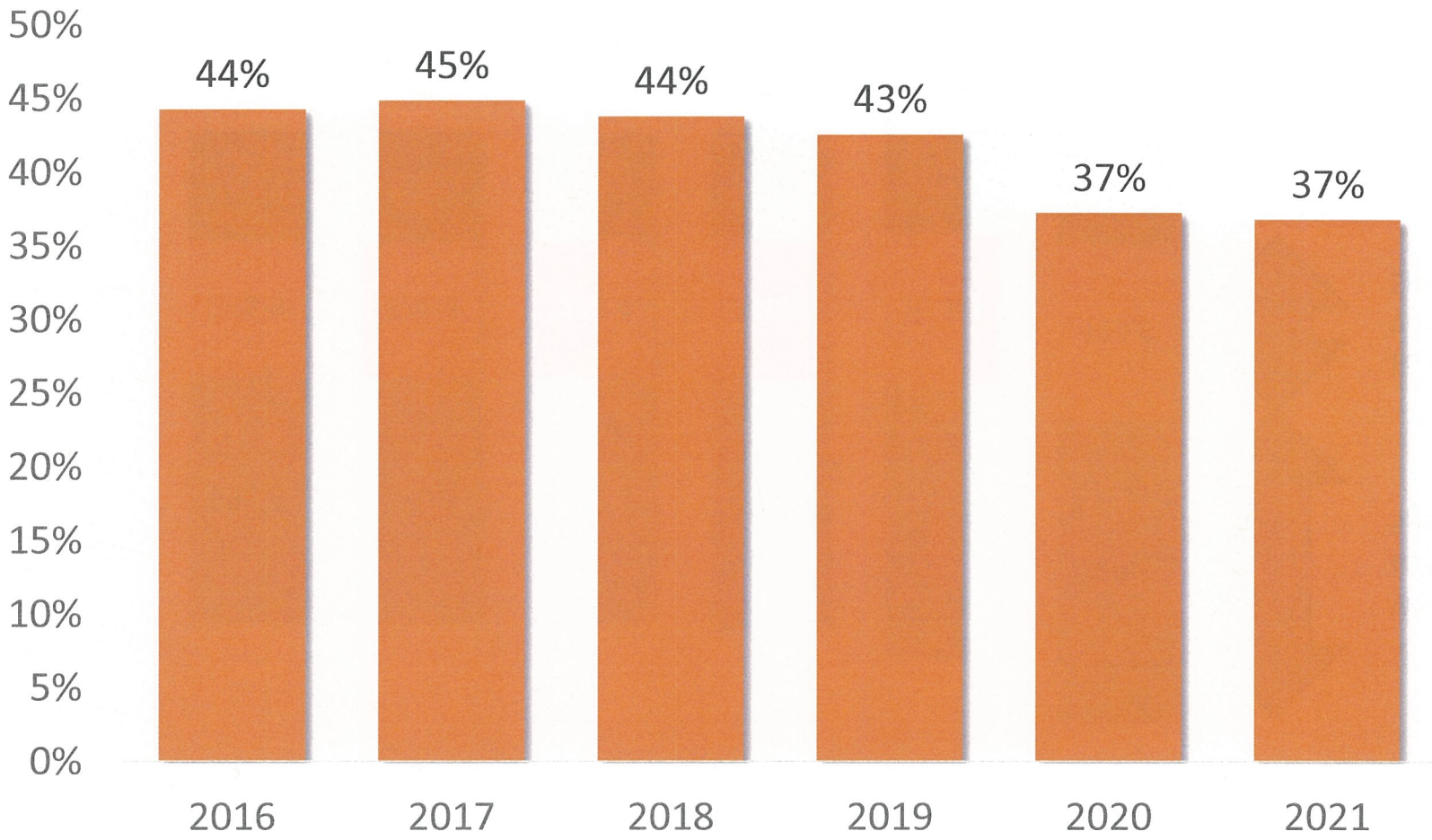
Requires willingness to accept additional marketing responsibilities

2020 Food dollar: Industry Group (nominal)

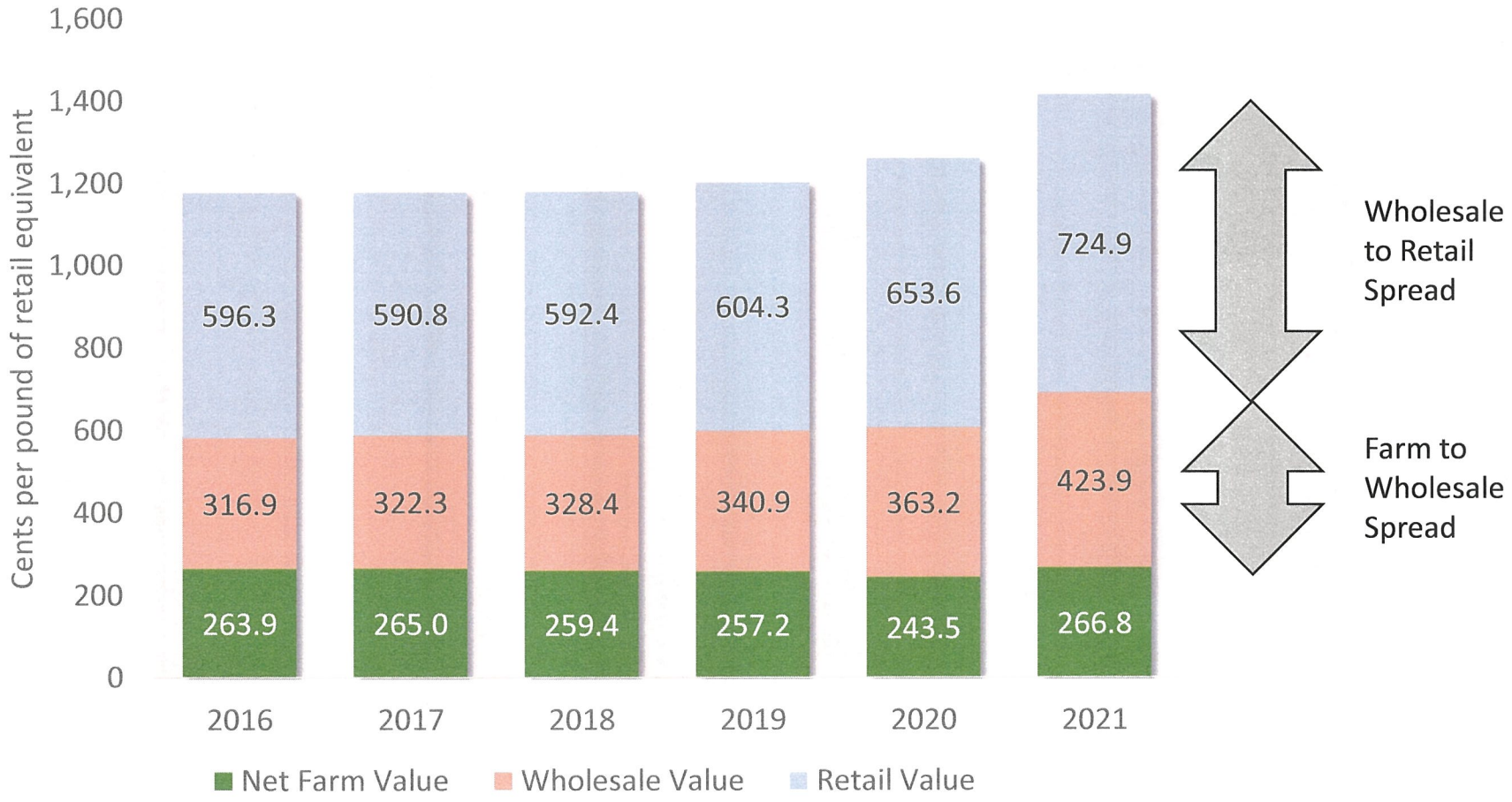
Source: USDA-ERS, 2020

Beef spreads

Beef spreads – Farmers' share



Beef spreads



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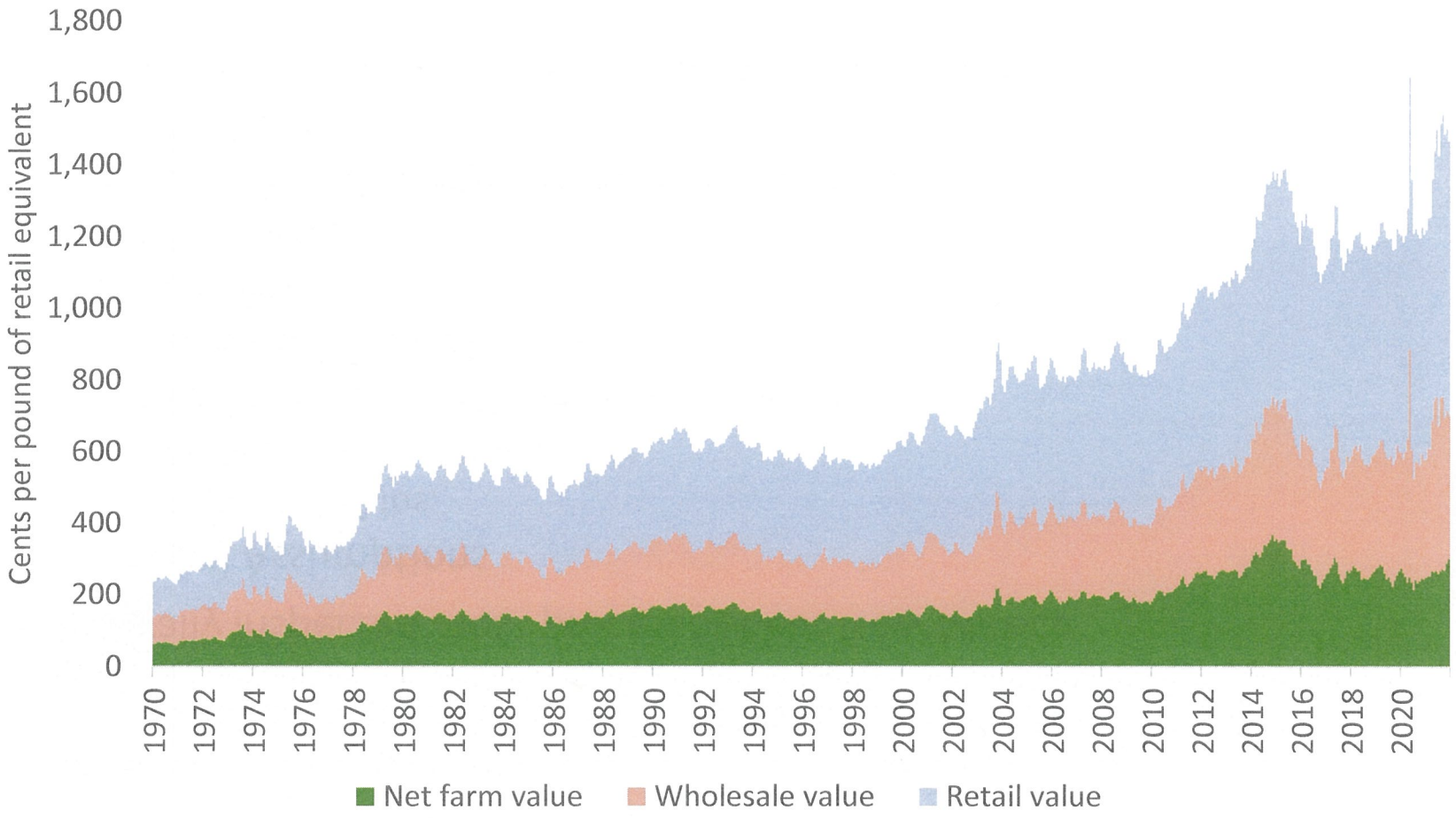

New Mexico meat processing challenges

Economics ("back-of-the-envelope")

To better understand the economics of meat processing I used a Colorado State University beef carcass calculator to find cuts and weights of meat from a beef animal. I used online posted prices for federally inspected meat processor near New Mexico

- Animal Assumptions
  - Weight 1,250 lbs.
  - 64% HCW as % of live weight
  - Retail meat cuts = 484 lbs. (CSU calculator)
  - $1.35 /lb. live weight price
- Processing
  - $100 kill fee
  - $1.30 /lb. cut & wrap fee (Federal inspection)
- Retail Prices

  Used online advertised meat prices from well-known chain

New Mexico meat processing challenges

Economics ("back-of-the-envelope")

- Animal Costs = $1,687.50 ($1.35 /lb. x 1,250 lbs.)
- Processing Costs = $1,140 ($100 kill fee + 800 lbs. x $1.30)
- Retail Value = $3,030.21 (excludes bone, fat/tissue/skin)
- Return = $202.71

A "producer" would have to market the meat for $202.71 ($0.42 /lb. marketing margin).