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2024 Contributions of the Washington Beef Sector

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2024 Contributions of the Washington Beef Sector

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Contents

1. Introduction and Study Overview

Washington State University and the Washington Beef Industry have been working to evaluate the 2024 economic conditions to understand the linkages of the beef industry to the broader economy. The beef industry is composed of cow-calf ranches, feedlot operations, and beef processing at packing plants sectors. This study seeks to report three key findings: 1) the changes in the underlying sectors over the past ten years, 2) changes in sector structure using primary data collected from surveys of the cow-calf and feedlot sectors, and 3) the overall economic contributions to Washington's economy.

Chapter 2 analyzes the beef sectors nationally, regionally, and for Washington State specifically. We first outline the evolution of cattle inventories geographically. Washington's inventory of beef cows is about half of the beef cow inventory of neighboring Pacific Northwest states. This is a long-standing relationship since the 1970's. This reflects differences in permanent pasture and rangeland acres. Washington has 2.3 million acres of permanent pasture and rangeland compared to Idaho with 7.6 million acres and Oregon with 8.6 million acres and reflects Washington's significantly lower federal grazing allotments on Bureau of Land Management and National Forest land. Nonetheless, Washington has several comparative advantages for cattle production in particular the availability and reliability of feed supplies, resulting in large imports into the feedlot sector. Washington also remains one of the top states for beef processing, importing large volumes of finished cattle for beef processing and export markets.

Chapter 3 outlines the results of the cow-calf and feedlot surveys. The surveys capture data on operational size, location, duration of operation, revenues, labor tax, and other operational expenses. All of this helps us to see where the supply chains of the cow-calf and feedlot industries link to. Due to having only two competitive commercial beef processing facilities in Washington, the highly competitive nature of those operations, and mandatory price reporting competitive exemptions on data reporting, the revenue and expenditure data were estimated using national data and production ratios.

Chapter 4 highlights the web of industries that are connected directly and indirectly to the beef sector, and how those other industries and their employees are affected by the new dollars the beef sector brings into the state. We are therefore able to show how new dollars enter the economy, and ripple through it creating jobs, income, and increase the value of final goods produced in the state. In total, in 2024 the beef sector contributed $2.08 billion to the Washington economy and supported, directly and indirectly, over 17,000 jobs.

Bolstered by strong consumer demand for beef that supports increasing price trends and year over year record high prices 2023 and 2024 have offset decreasing inventory numbers, Washington's cattle industry economic contributions to the state show strong growth, in sales and gross state product, but weaker to stagnant growth in incomes. Continued growth for the sector will likely be determined by competitive factors in the beef production chain and national cattle inventory responses to drought.

Major Study Findings:

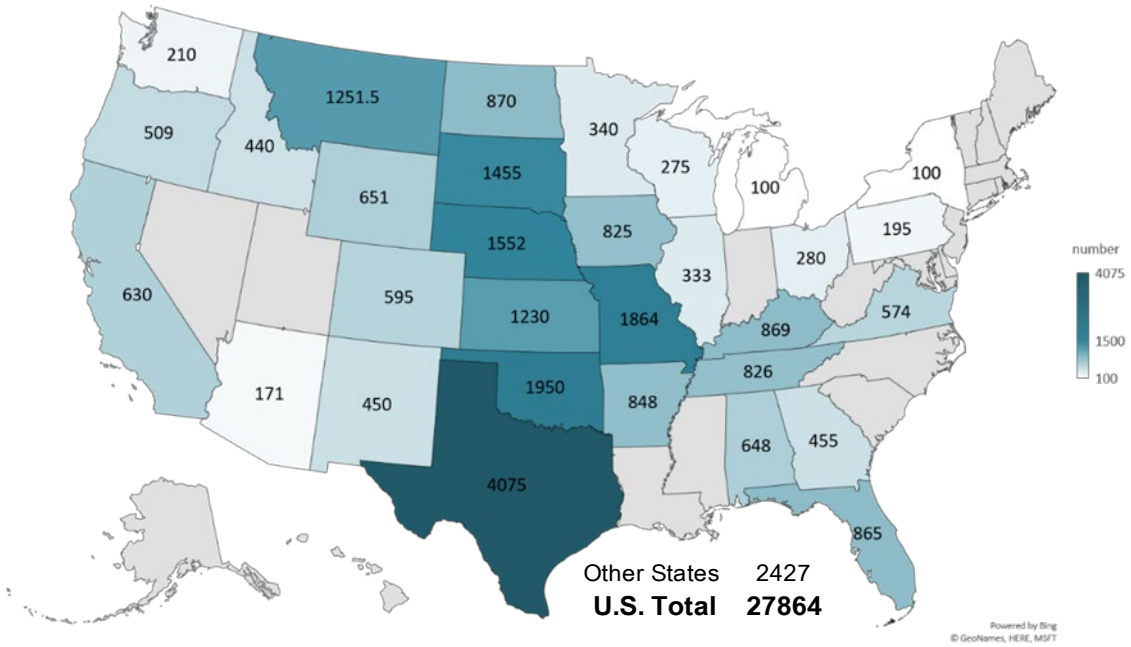
- The modeled 2024 Washington cattle production inventories based on USDA reports were 223,000 calves produced, 431,000 finished feedlot steers and heifers sent to slaughter, and 1,043,000 head of cattle slaughtered.
- Washington's beef cow inventory peaked in 1984 at 436,000 cows and has declined to 223,000 cows in 2024. Washington's beef herd has declined at a much higher rate than the rest of the U.S. The same source of data over the same time frame shows that the U.S. herd peaked at 39.229 million head in 1982 and declined to 28.0 million head in 2024. This represents a 29% decline from peak to current for the U.S. beef herd. Comparatively, Washington's decline from peak to current is down 48%.
- Over a more recent five-year period comparing 2000 to 2024, Washington's cow herd inventory decreased 2% compared to the national herd decrease of 11%.
- Cattle production increases value at each step of the production phase. By having more feedlot cattle than calves produced, and having more cattle slaughtered than produced by feedlots magnifies the economic contribution of the industry at each sector.
- Cattle prices have increase sharply since the previous 2019 study, setting record high prices, above the previous price highs set the start of 2015. Cow-calf producers realized the greatest increase in price from 2020 to 2024 at 17% price growth followed by feedlot finished price of 15% and packer boxed beef cutout price of 7%.
- Washington's packing sector is the primary driving factor in the cattle industry's vertical supply chain. The packer is the market outlet for the feeding sector and in turn the feedlots are the primary market outlet for the cow-calf producers. Washington's packing sector has been relatively stable in terms of the number of cattle slaughtered since 2007 and reflects efficient use packing plant capacity. This market stability has provided confidence in market outlets and strongly contributes to Washington feedlots.
- The feedlot sector had the highest variation in inventory numbers from 2020 to 2024 reflecting the competitive challenges of feedlots sourcing placements as the inventory of feeder cattle declined. For 2024, the direct contributions to gross state product for the cow-calf sector was $169.7 million dollars. For the feedlot sector, it was $42.7 million dollars. For the processing sector, it was $297.1 million dollars. The combined beef industry's direct contributions to the state economy's bottom line were $509.4 million dollars.
- Direct cattle sales represent only part of the economic contribution of the beef sector. Input-output analysis was used to estimate the indirect and induced effects that result from the beef sectors input purchases, labor, and profits. The total value added economic contribution of the beef sector to Washington in 2024 was $2.08 billion.
- The total employment stemming from the beef sector was 17,172 FTE jobs. Most of those jobs, roughly 10,577, were attributable to the processing sector.

2. Market Structure and Sector Overview

Regional Cattle Inventories

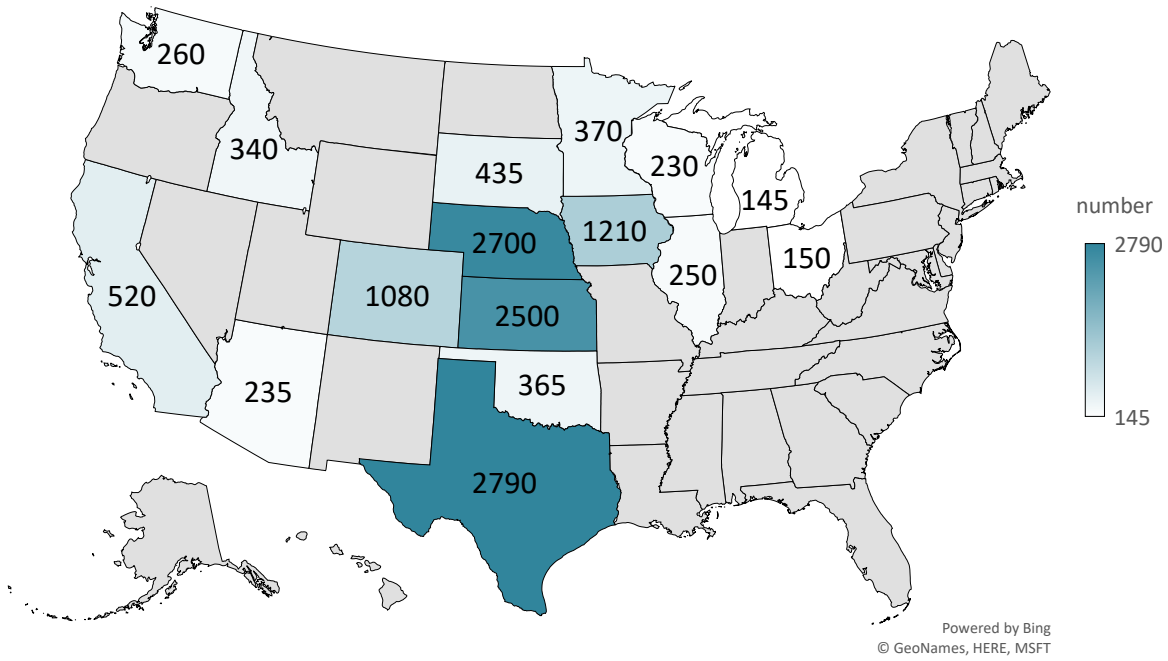
Washington's beef industry is unique in the Pacific Northwest. No other Pacific Northwest state has all three production sectors: cow-calf, feedlot, and packers as large collectively as Washington does. Washington has several competitive cattle production advantages in forage and crop aftermath grazing resources, a strong hay production industry supported by the resiliency of the Columbia Basin irrigation system, extensive grain and crop production byproduct feedstuffs, and a good transportation system for cattle movements to grazing, feedlots, and packers as well as beef products for both export and domestic markets. Washington has well established infrastructure for feedlots and packing facilities. Figures 2.1, 2.2 and 2.3 provide maps showing the inventory number of cows that calved, cattle on feed and commercial cattle slaughter respectively. The maps provide a regional perspective of the size of each sector.

Figure 2.1: *Beef Cows That Calved January 1, 2025 (1000 Head)*



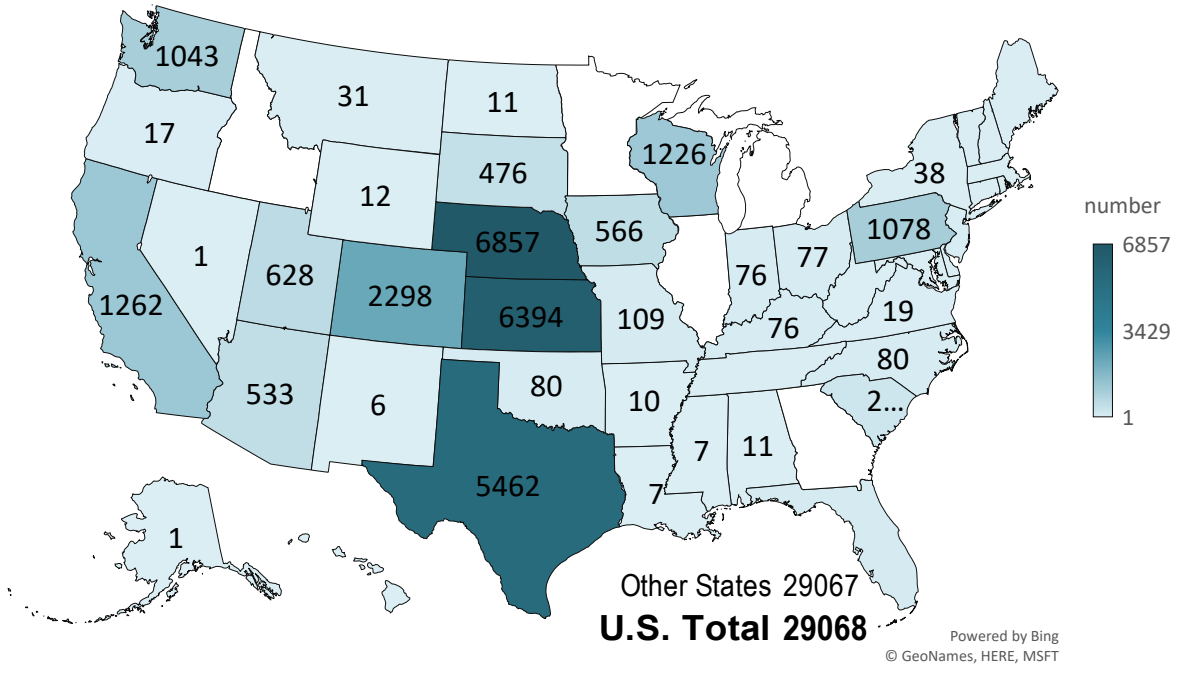
Source: USDA-NASS, Livestock Marketing Information Center

Figure 2.2. *Cattle on Feed January 1, 2025 (1000 Head)*



Source: USDA-NASS, Livestock Marketing Information Center

Figure 2.3. *Commercial Cattle Slaughter 2024 (1000 Head)*

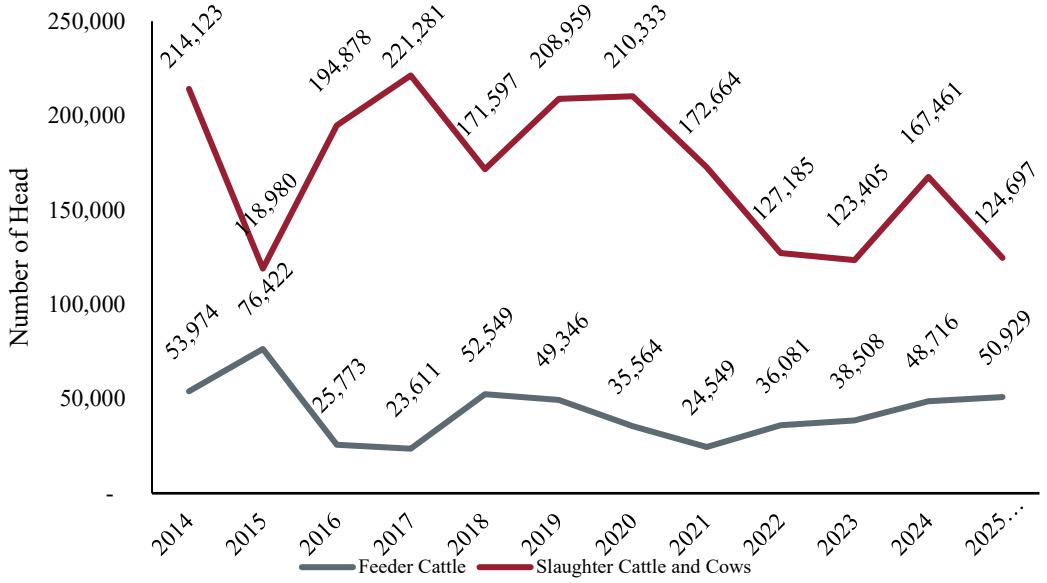


Source: USDA-NASS, Livestock Marketing Information Center

These figures show that Washington has the Pacific Northwest region's smallest cow-calf inventory, a regionally large cattle feeding sector that is smaller than Idaho's, and by far the largest commercial cattle slaughter sector. Washington is a regional cattle industry driver because it purchases cattle from outside Washington to supply its cattle feeding and commercial slaughter sectors. The maps also provide a rough indication of the regional flow of cattle.[1]

Considering the Pacific Northwest to include Washington, Oregon and Idaho, the cow-calf sector combined to produce about 1.16 million head of calves. The number of cattle on feed is about 0.60 million head. The number of federally inspected cattle slaughtered is about 1.06 million head. Data on the number of head slaughtered in Idaho was not reported due to USDA data disclosure rules to protect individual firm data confidentiality. If you add Montana to the Northwest region the combined inventory of calves produced increases dramatically to about 2.4 million head of calves, but there is little increase in cattle feeding and commercial slaughter. Previous studies considered that the cattle feeders get about two turns of cattle through their feedlot. Presently feedlots have increased the number of days on feed due to early placements and to produce heavier cattle. The feedlot survey data indicates the number of turns is 1.6. Figure 2.4 illustrates the number of Canadian live cattle imports into region 10 which includes Washington, Oregon, and Idaho since 2014. Combining Washington and Idaho feedlot marketings and Canadian slaughter imports closely approximates the number of cattle slaughtered in Washington. Beef on dairy cattle are not separately identified in USDA reported data.

Figure 2.4: *Number of Canadian Live Cattle Imports into Region 10 Washington, Idaho, or Oregon*



Source: USDA Weekly Canadian Live Animal Imports into U.S. by Destination (WA_LS637)

[1] It is a rough approximation because of the production time differences between calf production and weaning. Placing cattle on feed and the number of days on feed and the slaughter age each have different calendar years.

Washington Cow-Calf Sector

Washington's cow-calf sector is highly diverse in terms of the size of operation and geographic location across the state. Washington cow-calf operations range in size from a large number of small operations to a small number of large operations. Table 2.1 presents data on Washington's beef cow operations using data from the 2022 USDA Agriculture Census. The data reports that there are 4,627 beef cow-calf operations with an inventory of less than 10 beef cows. This represents 61% of the number of operations and accounts for about 9% of the inventory of beef cows. Conversely operations with a herd size to above 500 beef cows represent only about 1.0% of the number of operations but account for about 48% of the inventory of beef cows. The total number of operations decreased 22 percent from 9,295 in the 2017 census to 5,599 in the 2022 census. This demographic breakdown of operation size and inventory is typical across states.

Table 2.1: *Washington Number of Operations by Size of Operation 2022 Census*

Inventory of Beef Cows	Number of Operations	Percent of Operations	Percent Change in Operations from 2017	Percent of Inventory
1 TO 9 Head	4,627	60.9%	-20.6%	9%
10 TO 19 Head	1,265	16.6%	-6.7%	8%
20 TO 49 Head	944	12.4%	-20.0%	11%
50 TO 99 Head	333	4.4%	-19.0%	10%
100 TO 499 Head	352	4.6%	-24.8%	14%
500 TO 999 Head	64	0.8%	77.8%	22%
1,000 Or More Head	14	0.2%	7.7%	26%
Total	7,599	100.0%	-22%	100%

Source: https://data.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Volume_1,_Chapter_1_State_Level/Washington/st53_1_015_016.pdf

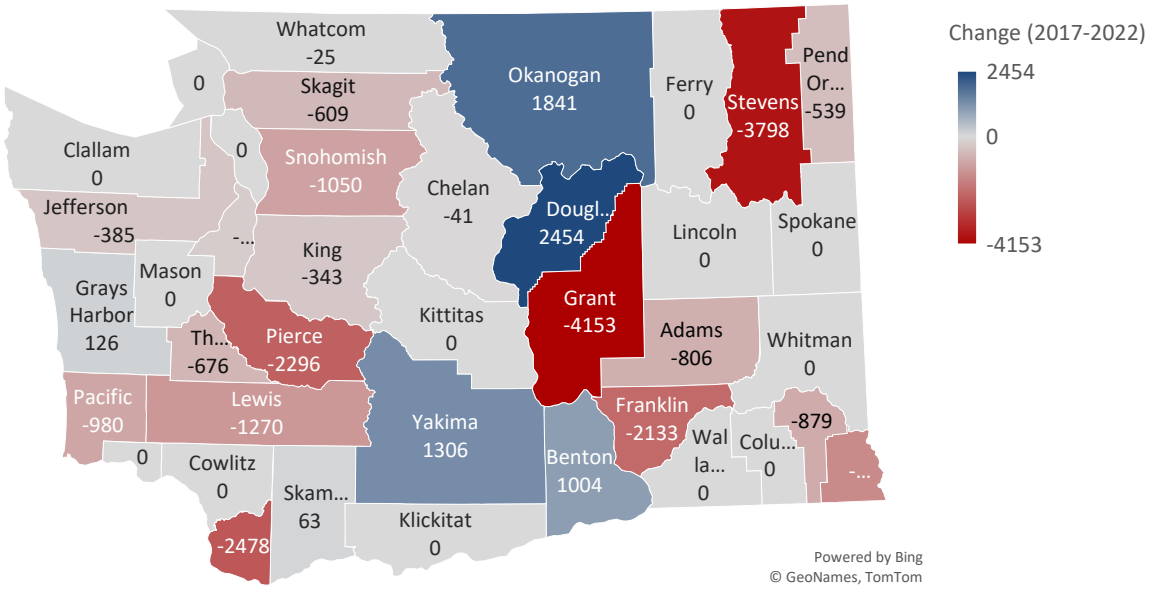
Beef cow inventory by county is only available in Agricultural Census years. Table 2.2 presents Washington's beef cow inventory by county. Several counties' data were not reported and is represented as a – in the table. For the reported counties, there was a total decrease of 40,153 cows representing a 20 percent inventory reduction. The largest inventory decrease occurred in Grant County followed by Stevens County. Counties with inventory increases include Douglas, Okanogan and Yakima.

Table 2.2: *Beef Cow Inventory and Change by County*

County	2017	2022	Change	Percent Change
Adams	9,581	8,775	-806	-8%
Asotin	5,653	4,148	-1,505	-27%
Benton	5,839	6,843	1,004	17%
Chelan	231	190	-41	-18%
Clallam	-.	-.	-.	-.
Clark	6,404	3,926	-2,478	-39%
Columbia	-.	-.	-.	-.
Cowlitz	-.	1,726	-.	-.
Douglas	6,501	8,955	2,454	38%
Ferry	-.	-.	-.	-.
Franklin	11,979	9,846	-2,133	-18%
Garfield	5,499	4,620	-879	-16%
Grant	18,176	14,023	-4,153	-23%
Grays harbor	1,800	1,926	126	7%
Island	-.	-.	-.	-.
Jefferson	851	466	-385	-45%
King	2,893	2,550	-343	-12%
Kitsap	694	449	-245	-35%
Kittitas	14,209	-.	-.	-.
Klickitat	12,315	-.	-.	-.
Lewis	8,321	7,051	-1,270	-15%
Lincoln	-.	11,610	-.	-.
Mason	980	-.	-.	-.
Okanogan	21,758	23,599	1,841	8%
Pacific	2,411	1,431	-980	-41%
Pend Oreille	2,335	1,796	-539	-23%
Pierce	5,560	3,264	-2,296	-41%
San Juan	935	-.	-.	-.
Skagit	4,549	3,940	-609	-13%
Skamania	314	377	63	20%
Snohomish	4,072	3,022	-1,050	-26%
Spokane	8,311	-.	-.	-.
Stevens	11,432	7,634	-3,798	-33%
Thurston	4,872	4,196	-676	-14%
Wahkiakum	-.	678	-.	-.
Walla Walla	-.	-.	-.	-.
Whatcom	3,694	3,669	-25	-1%
Whitman	-.	-.	-.	-.
Yakima	16,511	17,817	1,306	8%
Total	198,680	158,527	-40,153	-20%

Note: County totals don't match to state totals because of counties without data.
Table cell entries with a -. represents data not reported.
Source: USDA Quick Stats Census

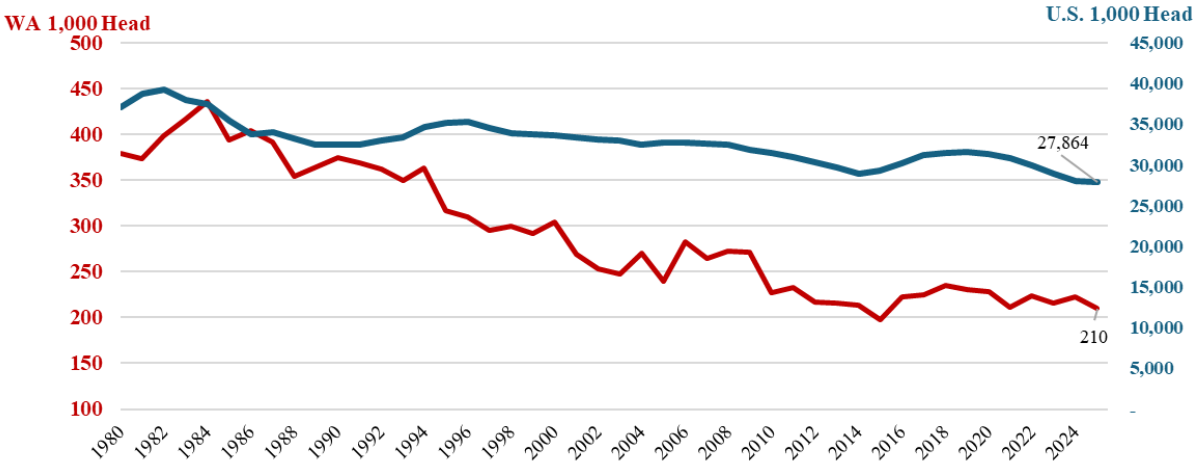
Figure 2.5: *Beef Cow Inventory Change (2017-2022) by County*



Source: USDA Quick Stats Census

As of January 1, 2025, the U.S. beef cow inventory stood at 27.86 million head, marking the lowest level since 1961. Washington's beef cow inventory declined from the 1984 record high, but the rate of decline has moderated since 2020. Figure 2.6 compares Washington's January 1 inventory number of beef cows to the total U.S. inventory from 1980 to 2025. Washington's beef cow inventory peaked in 1984 at 436,000 cows and is 210,000 cows in 2025. From 2020 to 2025, the average number of beef cows is 219,000. In 2024, Washington recorded 223,000 cows which is above the 5-year average.

Figure 2.6: *Washington versus U.S. Beef Cow Inventory 1980 to 2025*



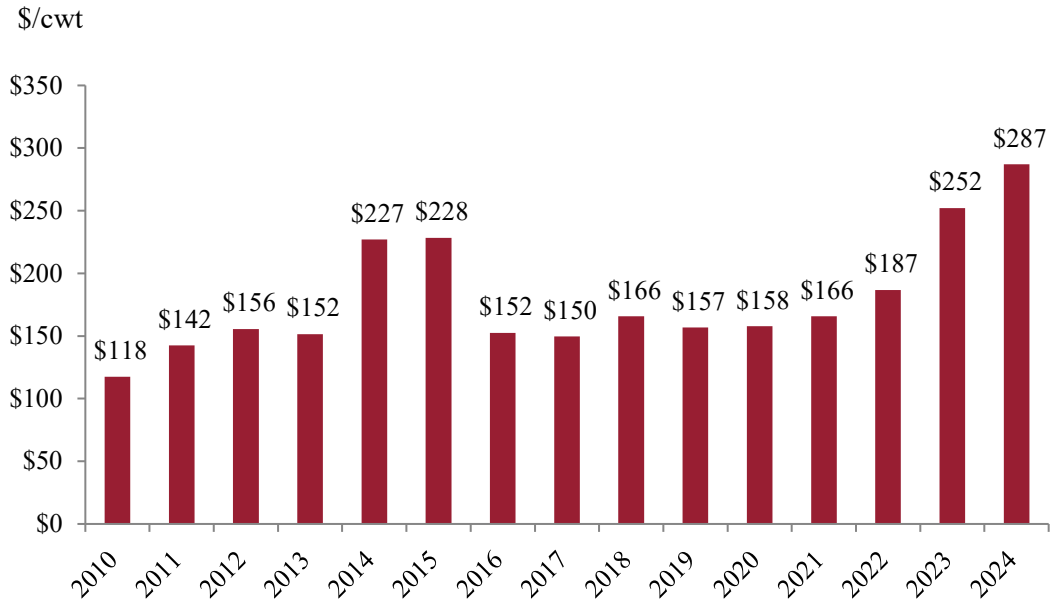
source: USDA Quick Stats Beef Cows Inventory

The variation in beef cow inventory from 2020 2025 is lower in Washington than compared to the U.S. The higher variation in cow inventory in large beef cow states such as Montana, Oklahoma, Nebraska, Texas and Kansas indicates that Washington has shown more resiliency in beef cow inventory when compared to larger beef cow states that have consistently decreased beef cow inventory since 2020.

Figure 2.7 presents average 500-600 lbs. feeder steer prices. The prices represent Washington auction prices reported to the USDA. Washington calf prices mirror national price dynamics. The previous record high price cycle was $238/cwt in 2015. In 2015 prices started the year high through April but declined month over month for the rest of the year representing the break in the cattle cycle. Prices fell and were low from 2016 to 2020. Since 2023, prices have set year over year record highs. For 2024, the average annual price for a 500-600 pound feeder steer was $287/cwt. Using a consumer price index deflation factor of 0.756 on the 2024 price of $287/cwt equates to a deflated 2015 comparable price of $217/cwt.

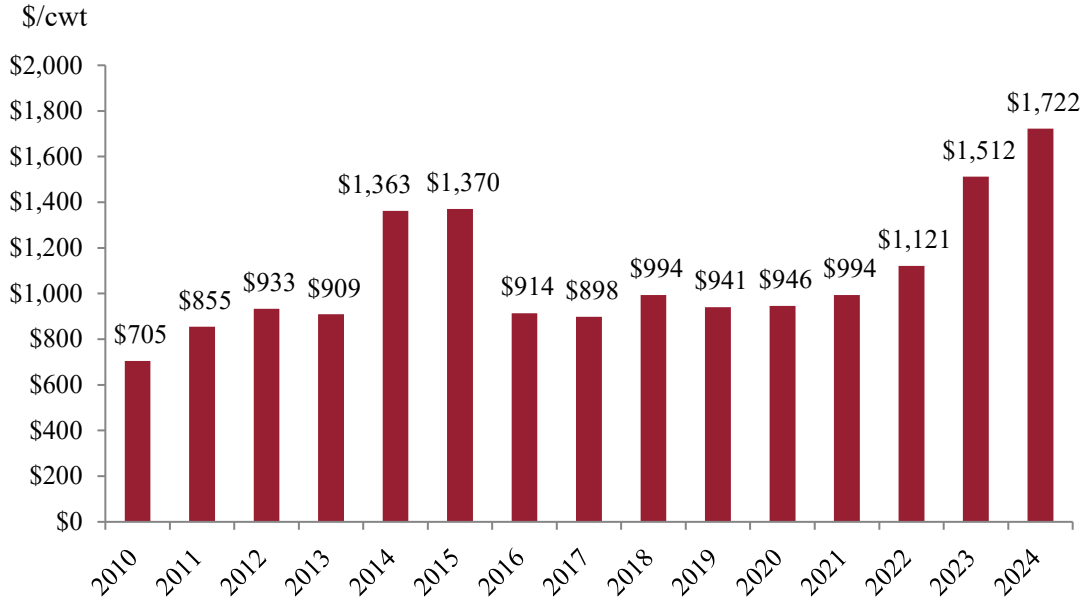
The price trend corresponds to value received for weaned calf sales. Based on the survey data collected for the study, the average weight of steers and heifers sold were 654 and 609 pounds respectively. Figure 2.8 converts the prices reported in Figure 2.7 to the value of a 600 pound steer. The record high value of the 600 pound feeder steer was $1,722.

Figure 2.7: *Washington Annual Average Feeder Steer Price 500-600 lbs.*



Source: USDA/AMS Weekly Combined Cattle Report - ML_LS795

Figure 2.8: *Washington 600 Pound Fall Feeder Steer Value $/head*



Source: USDA/AMS Weekly Combined Cattle Report - ML_LS795

Washington Feedlot Sector

Beef feedlots are a highly competitive sector with strong economies of scale which means that the production cost per head decreases as feedlot size increases. This has led to an increase in feedlot size, reduced the number of feedlots, and concentrated ownership of feedlots meaning that an owner has multiple feedlots at different locations. The USDA no longer reports the number of feedlot operations due to difficulties in defining a feedlot versus a backgrounding operation and revealing competitive feedlot information. The Washington Department of Agriculture identifies 10 licensed certified feedlot operators and their feedlots.[2] The number of feedlots does not impact the economic contribution study which uses the inventory of cattle on feed marketed that is reported by the USDA and representative production costs data that was obtained through a feedlot survey as part of this study and analyzing published feedlot cost of production studies.

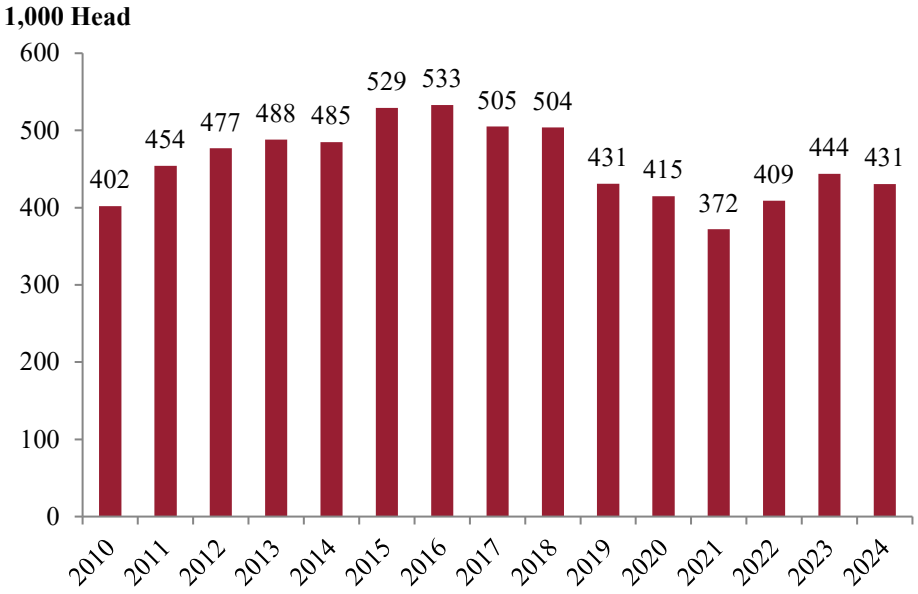
Defining and describing feedlots is difficult because feedlots manage cattle as an inventory flow and the in-weights of cattle placements vary widely within a year and across years depending on cattle market conditions and cattle availability which are impacted by feed costs, drought and pasture quality conditions. In terms of the cattle on feed inventory report on January 1, 2024 Washington maintains a ranking of 11th largest in the nation in terms of the number of cattle on feed at 275,000 head which is substantially lower than the top 3 states Texas, Kansas and Nebraska that each have about 2.7 million head on feed.

One statistic that can be used to analyze feedlots is tracking the number marketed. This represents the number sold and can be used to estimate the feedlot sectors total revenue. Figure

[2] (https://agr.wa.gov/departments/animals-livestock-and-pets/livestock-identification/licensed-certified-feedlots-public-markets)

2.9 presents the number of cattle marketed by Washington feedlots from 2010 to 2024. Both 2015 and 2016 have close to 530,000 head marketed each year and the rest of the years range from a low of 372,000 in 2021 to 431,000 in 2024.

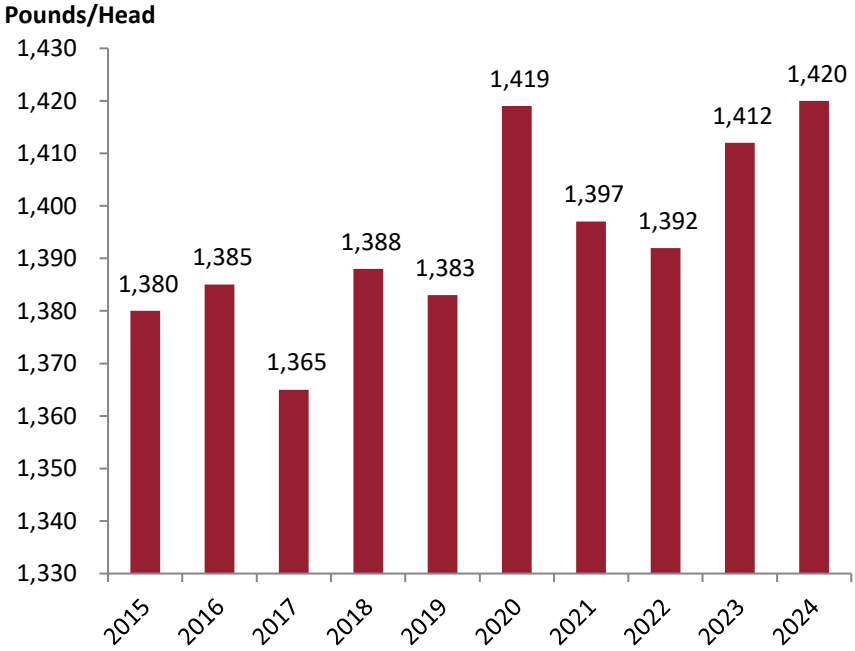
Figure 2.9: *Washington Feedlot Marketings 2010-2024*



Source: USDA NASS, Washington Annual Statistical Bulletin, and Feedlot Survey Results
https://www.nass.usda.gov/Statistics_by_State/Washington/Publications/Annual_Statistical_Bulletin/2024/WA_ANN_2024.pdf

Figure 2.10 presents the Washington sold fed cattle average live weight per year. This is also often referred to as finished weight. The finished live weight is both the weight sold by the feedlot and purchased by the packer. Finished weight is impacted by several interconnected factors. These include record high cattle prices that incentivizes higher finished weights, low feed costs that reduce cost of gain, and improvement in animal genetics that allows animals to convert feed to gain more efficiently while maintaining high carcass quality. Washington has followed the national trend for heavier finished weights. The average finished weight for fed cattle in Washington was 1,420 pounds in 2024.

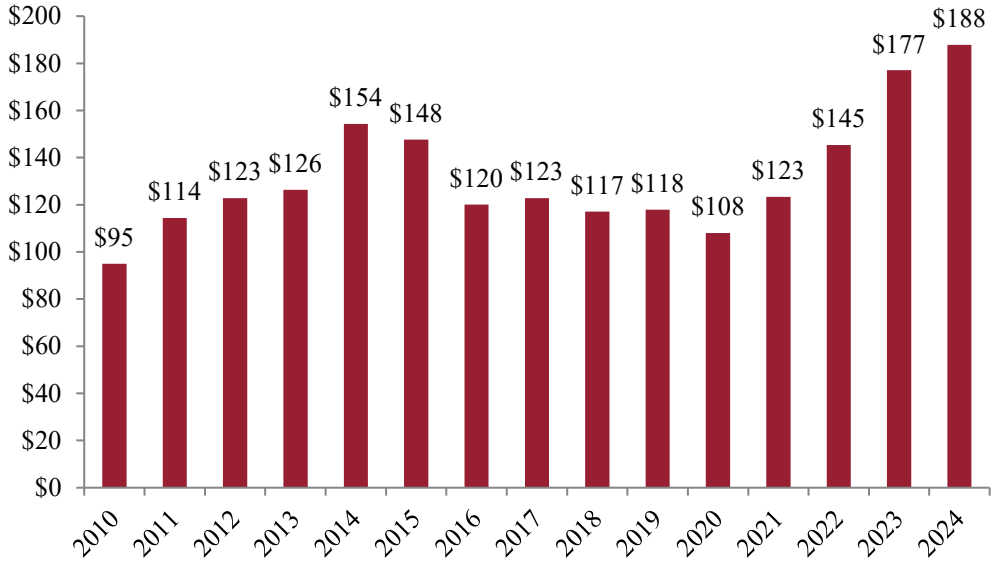
Figure 2.10: *Washington Fed Cattle Sold Average Live Weight*



Source: USDA NASS, Washington Annual Statistical Bulletin, and Feedlot Survey Results

The USDA does not report a finished fed cattle price for Washington. Data from the feedlot survey for this study, and discussions with the Washington packers about cattle prices supports our assumption that the available 5 area average closely represents Washington finished cattle prices. Figure 2.11 presents the average annual finished cattle price. The price trend for finished cattle follows feeder cattle prices with a previous cattle cycle high prices in 2014 and 2015 followed by year over year record highs in 2023 and 2024. The 2024 finished cattle price was a record high at $188 per cwt.

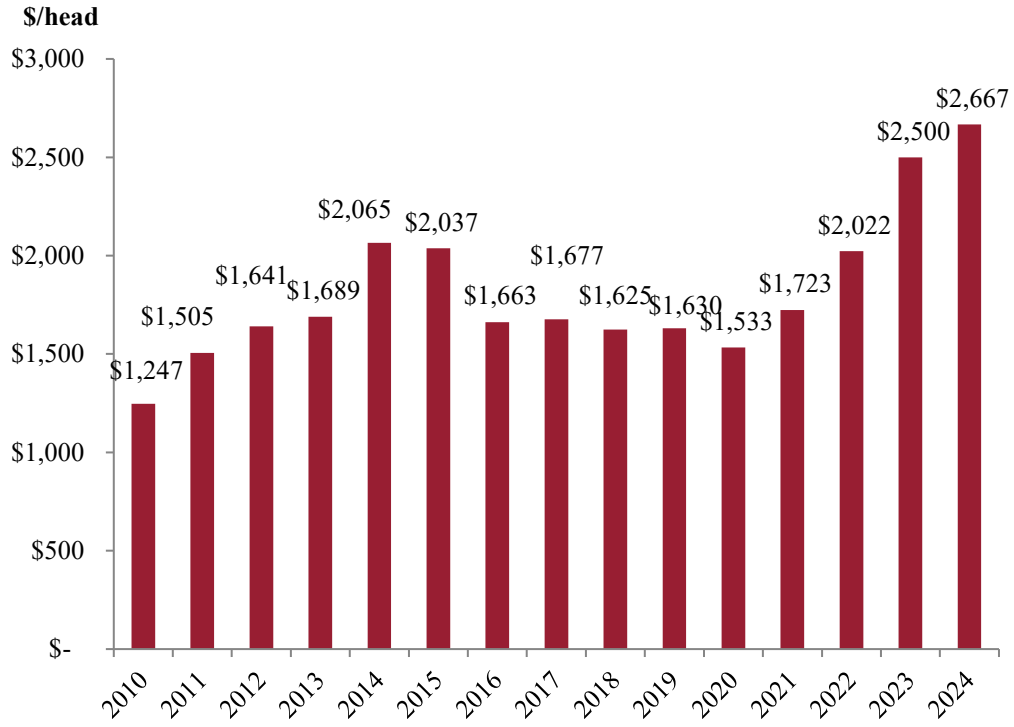
Figure 2.11: *5 Market Annual Average Finished Cattle Price (Texas-Oklahoma, Kansas, Nebraska, Colorado and Iowa-Minnesota)*



Source: www.LMIC.info

Figure 2.12 presents the average per head finished value using the finished weight in Figure 2.10 and prices in Figure 2.11. The record high value of a finished feedlot animal was $2,667.

Figure 2.12: *Washington Average Finished Cattle Value $/head*



Source: Calculated by Author

Beef on Dairy Production in Washington

The expansion of beef-on-dairy production is largely driven by changing economic conditions within both the dairy and beef sectors. In response to low profit margins in the dairy sector, dairy producers are seeking ways to diversify revenue and capture more value from existing resources. Beef-on-dairy (BoD) production has expanded because it allows dairy farms to produce calves with significantly higher market value than pure dairy bred calves. Shifts in market prices, production costs, and genetic technology have made it increasingly attractive for dairy operations to produce animals intended for beef markets. BoD calves can improve feed efficiency and carcass quality profiles compared with purebred dairy bulls, enhancing downstream margins. Recently U.S. dairies have adopted BoD strategies at scale, driven by low milk margins, and the historically low national beef herd inventory supporting high cattle prices.

Data from the National Association of Animal Breeders shows beef semen sales to dairies have increased sharply while dairy sire semen has declined reflecting a production change to BoD calves. From a macro perspective, BoD has reallocated dairy-origin animals within the fed-cattle mix. Historically, dairy calves not kept as dairy replacements, were fed out for beef production. Purebred dairy cattle, primarily Holsteins, have several disadvantages when used for beef production because their genetics are optimized for milk output rather than muscle development. Research shows that Holstein steers typically have reduced feed efficiency, meaning they require more feed per pound of gain compared with beef-type cattle. They also tend to have flatter muscling, lower dressing percentages, and reduced red-meat yield, which leads to carcass discounts in the marketplace. Health challenges can be more common as well, with Holstein steers showing poorer overall health performance in feedlots relative to beef breeds. Although they often grade USDA Choice or better, Holstein carcasses receive price deductions because of lighter muscling and lower yield grades. BoD calves overcome these disadvantages through heterosis while taking advantage of their high quality grades. It is important to note that the shift to produce BoD calves does not represent a new population of fed cattle but a substitution of BoD feeders for purebred Holstein feeders, an important context when assessing BoD as a supply supplement during cattle cycle inventory troughs.

The cornerstone of BoD economics is the price differential for calves at birth. Crossbred beef-dairy calves generally command $400–$600 per head versus about $50 for a purebred Holstein bull calf. Dairies have reported $800–$1,000 per day-old, crossbred calf, reflecting robust demand and improved buyer confidence in feedlot performance and carcass outcomes. [choicesmagazine.org] Price premiums reflect heterosis and the superior muscling/yield of crossbreds compared with straight dairy bulls. When scaled across a herd, the aggregate premium is shifting breeding surplus dairy cows to beef semen materially increases calf revenue without adding major on-farm costs using routine artificial insemination management.

Industry analyses show that BoD animals are becoming more common in feedlots and contributing meaningfully to U.S. beef supply. BoD animals supply both muscle cuts and trim for ground in the same manner as traditional beef cattle breeds. It is estimated that BoD cattle account for roughly 20% of total beef production, CoBank. Areas with high dairy production will see more BoD influence. The PNW has Idaho, the third largest dairy production state with 700,000 dairy cows and Washington and Oregon with 255,000 and 111,000 dairy cows

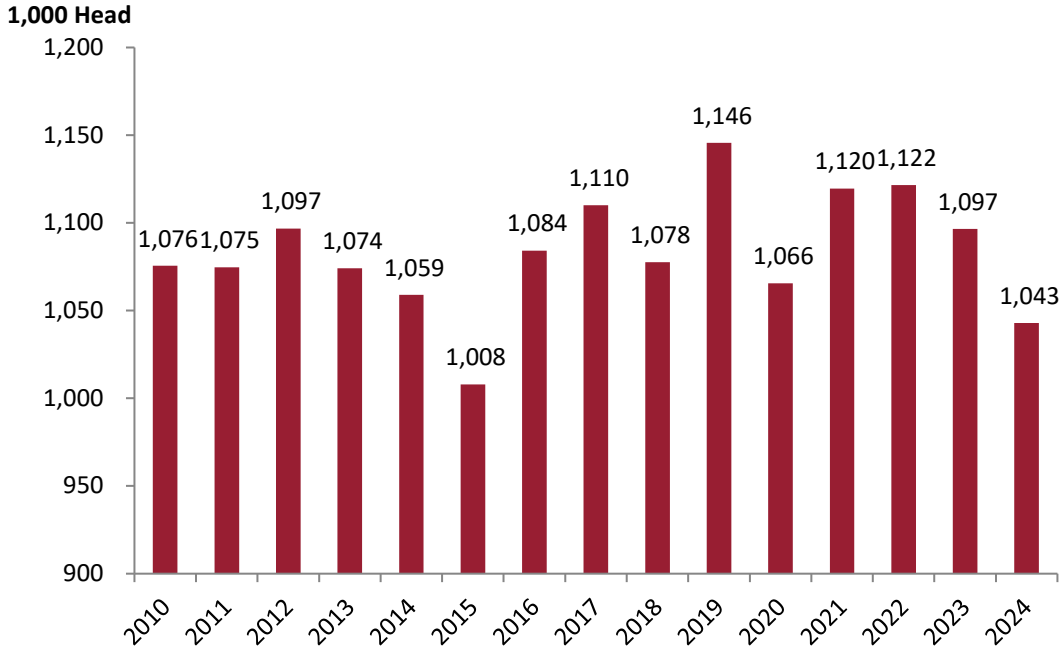
respectively. The combined inventory of over 1 million dairy cows in the PNW represents a significant inventory to supply BoD calves to the beef production supply chain.

Washington Packer Sector

Livestock packers operate in a highly competitive economic environment relative to purchasing cattle, labor, and selling beef products. A high majority of Pacific Northwest feedlot cattle are processed in one of Washington's two packing plants: Agri Beef Foods, LLC in Toppenish WA, or Tyson Foods Inc. Wallula WA. The cull cow packing capacity is limited in Washington and services both dairy and beef cull cattle. A large number of culls are shipped out of the state for processing.

Figure 2.13 presents the number of federally inspected commercial cattle slaughtered in Washington. Since 2010 the annual average number of cattle slaughtered is 1.083 million head. The number slaughtered has been highly stable ranging between the low in 2015 to the high in 2019. The number slaughtered has declined each year since 2022 reflecting declining cattle inventories. In 2024, 1.043 million head were commercially slaughtered.

Figure 2.13: *The Number of Commercial Cattle Slaughtered in Washington*



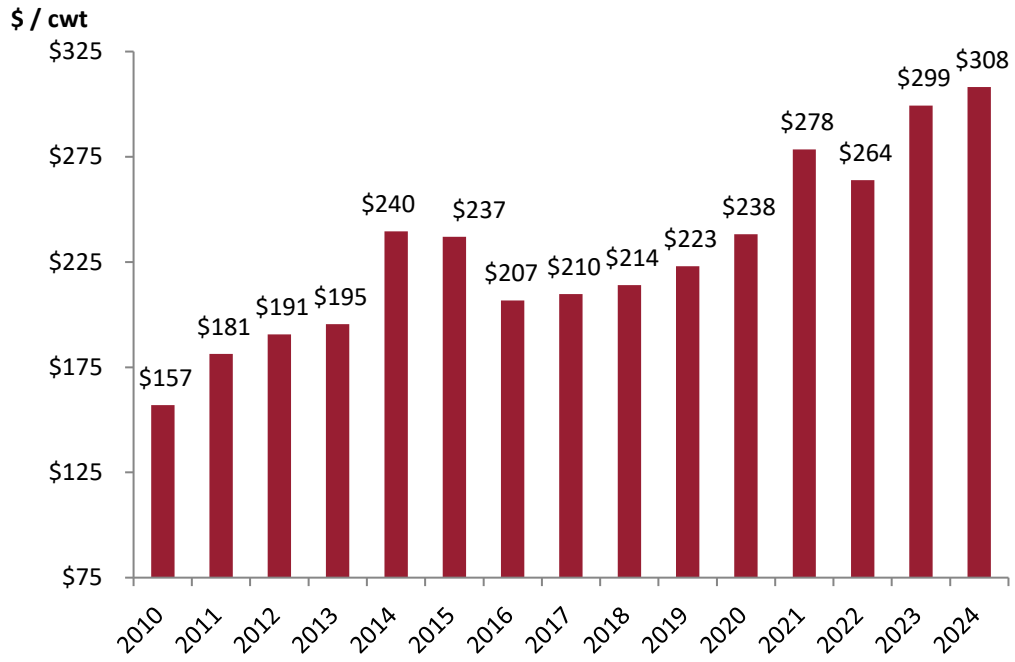
Source:
https://www.nass.usda.gov/Statistics_by_State/Washington/Publications/Annual_Statistical_Bulletin/2024/WA_ANN_2024.pdf

Packers purchase live finished cattle and process them into wholesale boxed beef cuts. Although packers sell boxed beef, a common method to report wholesale meat value relative to per head value is boxed beef cut out value.

Figure 2.14 presents annual average boxed beef cut out values. Cut out values are not reported for Washington separately due to competitive disclosure rules of mandatory price reporting. Data

collection discussions with packing plants indicate that national cut out value data accurately represents Washington price trends. Cutout values topped $300 per cwt in 2024 and has continued on an upward price trend throughout 2025, peaking at over $400 per cwt in August, 2025.

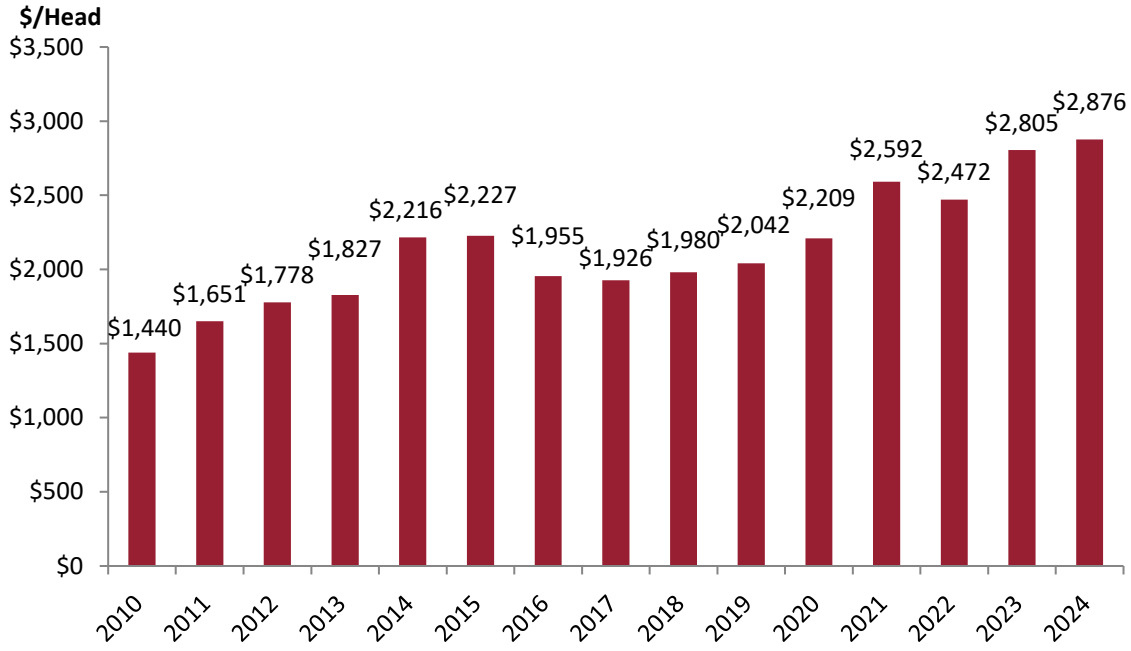
Figure 2.14: *Annual Average Boxed Beef Cut Out Values*



Source: USDA AMS daily report LM_XB403

Dressing percent is the conversion factor from live weight to carcass weight. The industry accepted dressing percentage for a typical beef animal harvested in the United States is 62%. The drop credit is the value packers receive for hides and variety meats. The drop credit is reported by the USDA on a live weight basis, see USDA Beef Carcass Prices. Figure 2.15 presents the calculated per head wholesale value of a processed beef animal using the average finished weight of Washington feedlot cattle as reported in Figure 2.10, a 62% dressing percentage, and a drop credit of $11.58/cwt live basis.

Figure 2.15: *Calculated Washington Per Head Beef Wholesale Value*



Source: Author calculation

The calculated per head wholesale beef value set record high values in 2024 at $2,876 and $2,805 in 2023. For each cattle production sector, the percent year over year value changes annually and over a 5-year period are reported in Table 2.2. The cow-calf sector experienced the largest percent increases over the five-year reported time frame at 17% followed by the feedlot sector at 15% and the packer sector 7%.

Table 2.2: *Percent Change in Beef Values by Sector*

Sector	2020 to 2021	2021 to 2022	2022 to 2023	2023 to 2024	5 year 2020 to 2024
Cow-calf	5%	13%	35%	14%	17%
Feedlot	12%	17%	24%	7%	15%
Packer	17%	-5%	14%	2%	7%

The change in values are important relative to the economic contribution study. An industry generates economic activity by purchasing inputs from supplying industries in the region. The beef industry purchases cattle inputs backward from the packer sector back through the feedlot and then the cow-calf sectors

Summary of the Economic Condition of Washington's Beef Industry

Washington's packing sector is the primary driving factor in an integrated supply chain such as the beef industry, since the packer sector is the market outlet for the feeding sector and in turn the feedlots are the primary market outlet for the cow-calf producers. Washington's packing sector has been stable in terms of the number of cattle slaughtered.

3. Survey Results and Descriptive Statistics

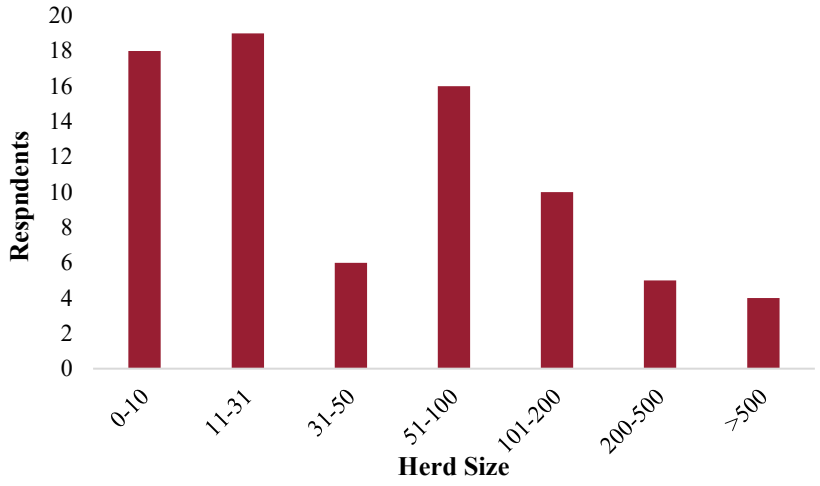
Surveys of the cow-calf and feedlot industries were conducted by WSU's Social and Economic Sciences Research Center (SESRC) through June and July, 2025. Information collected by the surveys focused on each sector's income, expenses, input purchases, capital improvements, and taxes. It is critical to know how much of the spending was local, as money leaking out of the economy does not contribute to gross state product. This data is used to supplement USDA statistical reports, cow-calf and feedlot enterprise budgets, and IMPLAN transaction tables for Washington State.

Cow-Calf Survey Data

Complete cow-calf Surveys were collected from 89 unique respondents. Several respondents indicated they were unwilling to provide revenue, cost, inventory, or other critical data. Those surveys were removed from the following reported data sets. The 89 completed surveys accounted for 10,011 cows and heifers that calved in 2024. This is about 5 percent of the state inventory of cows and heifers that calved. Although this response rate is low the quality of the data returned is high and provided key information that allows us to augment the revenue and cost data needed for the input-output model. See Appendix 1.

Washington cow-calf ranches have a long history of operating at their home location. On average cow-calf operations have been at their home location for 51 years with 14 respondents identifying their family have operated their ranch for over 100 years. Figure 3.1 provides the respondents herd size demographics. The herd size demographics follow the overall USDA herd size demographics with a large number of small producers ranging to a low number of large producers. Historically, respondents with larger heard sizes were more likely to respond to the survey request.[3] Overall, the survey provides a representation of Washington's cow-calf sector from small to large herds.

Figure 3.1: *Cow-calf Survey Number of Respondents by Herd Size*



Spring calving remains the predominant calving period but both spring and fall calving herds

[3] The cost and revenue per head data were assumed to be representative of state averages.

declarations increased. Of the reporting herds, about 87 percent declared they had spring calving herds, but only 66% were spring calving only. Fall only calving herds were 13 percent of the respondents and herds with both spring and fall calving were 21 percent, see Figure 3.2. This is an increase of 5 percent compared to the 2019 study in operations in operations using both spring and fall calving.

Figure 3.2: *Cow-calf Survey Calving Season Responses*

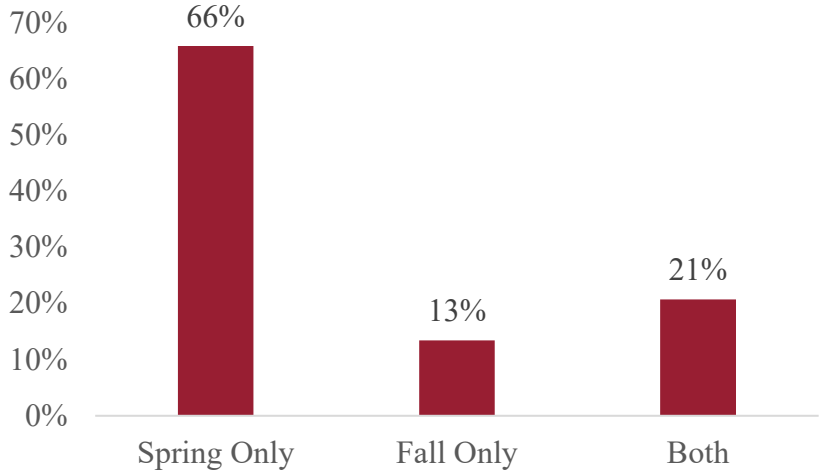


Table 3.1 shows the method of sales, retention, and other inventory changes (kept for beef, or loss due to death). Respondents were likely captured in multiple rows because a ranch could use multiple sale outlets. Of the 89 respondents, 73 reported sales or retention. The most common method of sale was sold at live auction followed by private treaty. In comparison to the previous 2019 study, the number sold through video auction increased and the number sold through private treaty decreased.

Table 3.1: *Cow-Calf Survey – Inventory Sales and Retention*

Method of Sale	Respondents	Number of Calves	Percent of Total
Sold at Live Auction	46	2,194	22%
Sold at Video Auction	4	1,679	16%
Sold by Private treaty	29	1,857	18%
Retained Ownership Stocker	12	955	9%
Retained Ownership Feedlot	4	1,518	15%
Kept for Beef	51	269	14%
Retained Heifers	36	1,468	3%
Death Loss	42	249	2%
Total	***-***	***10,189***	***100%***

Table 3.2 outlines the employment situation for the cow-calf operations, and this data is critical for the contribution analysis. This information allows us to ground truth the animal to employment ratio as well as the estimated wage bill for the cow calf sector. This data is used in the Input-Output model to ensure the employment to sales ratio and employee compensation values in that model are accurate. The average cow-calf operation responding to the survey

employed 25 people throughout the year with roughly 14 being part time or seasonal. Average annual compensation amounted to $51,472.

Table 3.2: *Cow-calf Survey - Labor Market Information*[4]

Description	n	Average	Standard Deviation
Number of full-time year-round employees	13	1	1.28
Number of part-time year-round employees	13	1	0.65
Number of seasonal labor employees	28	2	2.57
Number of family labor employees	54	2	2.10
Number of other employees	3	3	0.00
Average annual Payroll	52	$41,311	$47,155
Average Annual Benefits	35	$10,161	$6,671

Table 3.3 shows average weight of steers, heifers, and cull cows at the time of sales. Reported steer weights ranged from 475 to 900 pounds. Heifer weights ranged from 300-800 pounds, and average cull l cow weight was 1,336.

Table 3.3: *Cow-calf Survey – Average Weights of Animals Sold*

Weights	n	Average (lbs)	Standard Deviation (lbs)
Steer calves	65	654	130
Heifer calves	60	609	98
Cull cows	59	1,336	201

Feedlot Survey

A feedlot survey was also developed to collect data from Washington feedlots. To preserve confidentiality the data was aggregated, and several regional identifiers were not included. This did not distort any statewide indicators that were collected or developed from the survey results.

Table 3.5 presents the survey results on 2024 placements. The predominant number of placements, about 54 percent, were purchased without partnership. The survey accounted for a total of 308,714 placements over the year. Survey results represent about 53 percent of placements reported for Washington by the USDA. The survey questions combined asking for the placements that were sourced from Washington. In total, 74,176 of the reported placements, or 24%, were sourced from Washington. The survey result on the number of head finished and shipped to the packer in 2024 was 214,790 head.

[4] Because this information is derived from the survey responses it has some bias because the smaller farms tend to report no employment. We simply report the raw results from the survey and the sample of respondents does not represent the entirety of the industry, in this case.

Table 3.5: *Feedlot Survey – Cattle Placements*

	Number of Head
Number of head purchased without partnership	155,398
Number of head purchased in partnership	4,354
Number of placements to be custom fed	148,504
Number of placements owned	458
Total	308,714

The survey asked about 19 questions on revenues and expenses that addressed cattle purchases, capital expenses, repairs, trucking, purchased and raised feed costs and animal pharmaceutical expenses. The responses to these questions were used to develop the feedlot revenue and cost budget provided as an Appendix. The employment survey responses are provided in Table 3.6. The number of feeders per FTE is about 784 at a labor cost of $82.17 and benefit cost per feeder of $12.57.

Table 3.6: *Feedlot Survey – Employment and Earnings*

Description	Value
Feeders per FTE employee	783.9
Labor cost per feeder	$82.17
Benefit cost per feeder	$12.57

4. Economics Model and Contributions

The agricultural sector in general and the beef industry specifically, represents basic industries to Washington. Basic industries provide income to a region by producing and exporting their output, purchasing production inputs, services and labor. The production of calves, finished feedlot animals, and beef processing products represent the *direct* economic contribution of the beef industry to Washington.

The beef industry also generates *indirect* economic contributions as the revenues from the sales of beef animals and products are re-spent in the local economy. The indirect impact of the beef industry on local economies includes purchases of a variety of agricultural inputs and professional services in the supply chain for producing beef. For example, the packers purchase cardboard packing products that generates economic activity from the firm producing the cardboard packing products. Indirect effects represent additional economic activity in Washington's economy driven by the business-to-business transactions stemming from beef exports. These effects appear as jobs and income in local industries serving the beef industry (e.g., veterinarians, feed suppliers, implement suppliers, packaging, trucking and transport).

In addition to the direct and indirect impacts of the production and sales of beef products, the beef industry is responsible for *induced* economic impacts in the form of the local goods and service purchased by households. As beef sector employees spend their salaries and wages in the state economy on retail goods, home improvement, entertainment, etc., those household-to-business transactions ripple through the economy. These induced expenditures translate into jobs and income for retailers, bank tellers, grocery store clerks, restaurant employees, and gas station attendants and so on.

The income generated directly by the beef sector adds to this interdependency; cow-calf, feedlot and beef processing employees spend their wages and salaries on groceries, housing, entertainment, and a range of other consumer goods and services. Typically, these expenditures occur locally, generating rural economic development. These additional linkages, beyond the beef industry and indirectly related sectors of the economy, create induced effects, which help to form a complex intertwining web of industries within Washington. So the relevant question to ask is not only what beef adds to the Washington economy directly, but also how much does the beef sector contribute to Washington's economy through this complex networking of industries.

Model Description

Input-Output models are designed to capture the entirety of this complex networking of industries and, in this case, show what portion of that web is dependent on the beef sector. To that end, this section of the report covers the technical aspects of the model and the nuances made to various components of it in order to ensure its accuracy. We begin by explaining the basics of any input-output model as well as the data used for this particular analysis. Next, we discuss how the model needed to be modified to ensure there was no double counting when evaluating the contributions of the production vs. processing components of the beef sector. Lastly, we outline the direct effects, sometimes referred to as the shock, the beef sector provides to the economy. The subsequent effects and total contributions are reported at the end of the chapter.

Basics of Input-Output Analysis

The system of accounts known as Input-Output (I-O) tables represent an economist's version of double-entry bookkeeping for industries. Figure 4.1 below shows a simplified version of an I-O matrix with just a hand full of industries. Each cell, in this table of accounts, is populated by dollar transactions.

Figure 4.1: *Aggregated form Input-Output Matrix*

		Producers as Consumers						**Final Demand**			
		Agric.	Min.	Const.	Manuf.	Services	Other	Households	Investment	Government	Net exports
Producers	Agric.										
	Min.										
	Const.										
	Manuf.										
	Services										
	Other										
Value Added	Labor							Gross Domestic Product			
	Returns to Capital										
	Taxes										

Reading down a column of this table shows what inputs an industry is buying in order to produce their output. The Agriculture column, for example, may buy seed from themselves, fertilizer and farm equipment from the manufacturing sector, and legal and accounting services from the service sector. Payments to agricultural employees are captured in the "Labor" row. Payments must be made to owners of capital, and the industry pays taxes to the government. This is where the survey data enabled us to isolate the cow-calf, and feedlot operations. Reading across a row tells us where an industry's income originates. Sticking with agriculture, they sell seed to others in the agricultural sector; cattle are sold to processing plants in the manufacturing sector, as is the case with feedlots and slaughterhouses, or perhaps a ranch sells beef directly to consumers. A portion of a household's expenditures will go to buying agricultural goods, and even government may purchase agricultural goods. Lastly, the agricultural industry will sell its output out-of-state, via the "Net exports" column.

Summing all the labor, capital, and tax payments for all industries gives the sum of all value added and will equal the Gross Regional Product (GRP) of the region.[5] Similarly summing all of the expenditures of households, government, investment, and net exports yields the GRP of the region. These two methods of calculating GRP are known as the Income and Expenditure approaches, respectively, and they represent a check for ensuring all accounts balance. It is through the I-O system that we are able to trace the dollars through the economy and calculate multiplier effects.

[5] In our case the region is Washington State.

However, it is only through selling products outside of the region that an economy is able to attract new dollars into the region. Economists distinguish between industries that are export-oriented and those that serve the local economy, recirculating the dollars once they are in the economy. We call export-oriented industries "basic" and resident serving industries "non-basic." The beef sector, as with most agricultural and natural resource industries, are considered basic industries. Even though cow-calf and feedlots in Washington sell most of their product to processors in state, the majority of processed beef product are exported outside of the region or state. The basic industries that bring dollars into the economy support the non-basic industries, which could not exist locally without the income to the economy from exports. As such the employment contributions of basic industries support more than the employment directly within the industry.

Basic vs. Non-Basic Impacts: Which Industry Support the Economy?
A small agricultural town may seem to have a large medical industry in terms of employment, while the number of farm employment is fairly low, and often seasonal. However, the farms are exporting their product and bringing money into the economy. The doctor's offices are predominantly serving the residents. In this story, it is the farmers that are supporting the economy and the doctors are retaining the money within the economy. However, it should be clear that the farms would continue to exist in the absence of the doctor's offices, while the doctor's offices would not be likely to stay in the absence of the farms. In this setting, the non-basic medical jobs rely on the basic agricultural jobs. The employment impacts, including many of the doctors and nurses, would be attributed to the non-basic agricultural industries.

This story gets more complex in the case of beef, dairy, apples, potatoes, etc. where processing occurs near the primary commodity input. We structure these models to show the interdependency of the grower and processor and assume the grow operation is the dominate basic force. This is similar to coal mining or fishing operations where processing is forced to locate where the source of the commodity is located.

Model and Sector Modifications

One of the primary concerns when doing economic contribution studies is the potential for double counting. If we were to claim all the backward links from the slaughterhouses, and then also claim all the backward links of the feedlots, and then all the backward links of the cow-calf operations, all of the animal contributions would be counted three times, once when the calves are sold to the feedlots, once when the feedlots sell the animal to the slaughterhouses, and finally when the slaughterhouses sell the boxed beef. This triple counting of the beef sector supply chain has to be prevented for an accurate analysis. However, we cannot claim only the direct effects of the slaughterhouses either. Doing so would miss the non-beef sector components of the animal processing supply chain, i.e., leaving out electricity, transportation, lab testing expenses, etc. In order to capture all contributions through the supply chain, but prevent the double counting, we can sever the expenditure link between the industries in the sector (Steinback 2004).

This gives slightly more weight to the cow-calf and feedlot operations. Had we maintained the

producer-processor transactional links and only shocked the slaughterhouse exports, beef processors would appear much larger and the producers (cow-calf and feedlot ranches) would appear much smaller. Severing the transactional link is, in our opinion, a more equitable approach for allocating contributions amongst the firms within the beef sector.

The other important component in avoiding double counting is to report value added, also known as gross state product, rather than sales. Though the model is built on producer prices and sales transactions, summing up sales receipts will overstate the actual productivity of a region. If a dairy produces milk, milk is sold to a processor, the processor sells cheese to a commercial pizzeria, and the pizzeria sells pizzas to a retailer, the value of the milk is being incorporated and captured in each round of transactions. To prevent this double, triple, and quadruple counting we report contributions on a value-added basis.

Sales vs. value-added
A way to explain why sales overstates impacts is to imagine individuals spending money in a regional economy. Suppose an individual spends $40,000 on a new truck. Another individual spends the same amount on an appendectomy at the regional hospital. From a sales perspective, the impacts are the same, $40,000. However, from a value-added perspective the purchase of the truck provides less to the regional economy. Perhaps $30,000 of the truck purchase had to immediately go to the manufacturer back in Detroit or Japan. Conversely, the appendectomy at the hospital probably saw most of the spending stay local as income to the doctors, nurses and hospital staff. Perhaps only $10,000 leaves the region for importing of capital assets like the hospital bed, scalpels, etc. From a value-added perspective, the hospital is more valuable than the auto dealership even though they are equivalent from a sales perspective.

Contributions

The input-output model used in this analysis came from the IMPLAN software and model data for Washington. The contribution of the industry to the Washington economy is measured by different types of impact: direct effects, the immediate effects related to the production and processing of cattle; indirect effects, changes arising from inter-industry transactions as supplying industries respond to the demand from the directly affected industry; and induced effects, the effects due to the local spending on goods and services by employees in the directly and indirectly affected industry sectors. Table 4.1 shows these effects measured in terms of Sales transactions, value added or gross regional product, income, and full-time equivalent employment. In estimating the economic contributions of individual industries, the backward linkages between the cow-calf and feedlot sectors, and between the feedlot and processing sectors were broken in order to avoid double counting when aggregating the effects for the beef sector.

Table 4.1: *Beef Sector Economic Contributions by Industry, Effect, and Measure*

Cow-Calf	Sales	Value Added	Income	Jobs
Direct	$329,930,801	$169,684,896	$128,863,170	2,683
Indirect	$205,887,395	$111,107,917	$79,538,236	969
Induced	$33,023,931	$21,933,114	$10,618,702	137
Total	***$568,842,127***	***$302,725,927***	***$219,020,108***	***3,788***

Feedlots	Sales	Value Added	Income	Jobs
Direct	$621,143,371	$42,702,278	$36,115,841	717
Indirect	$606,675,553	$243,677,972	$174,340,366	1,656
Induced	$104,544,003	$69,434,587	$33,660,692	434
Total	***$1,332,362,927***	***$355,814,837***	***$244,116,900***	***2,807***

Processors	Sales	Value Added	Income	Jobs
Direct	$2,175,197,582	$297,058,939	$223,430,184	3,015
Indirect	$1,128,750,811	$699,226,497	$561,656,836	4,894
Induced	$640,900,953	$425,677,768	$206,481,694	2,667
Total	***$3,944,849,346***	***$1,421,963,204***	***$991,568,714***	***10,577***

Total	Sales	Value Added	Income	Jobs
Direct	$3,126,271,755	$509,446,113	$388,409,195	6,414
Indirect	$1,941,313,759	$1,054,012,386	$815,535,438	7,520
Induced	$778,468,886	$517,045,469	$250,761,088	3,238
Total	***$5,846,054,400***	***$2,080,503,968***	***$1,454,705,722***	***17,172***

In 2024, the Washington beef sector generated nearly $3.12 billion in direct sales, of which about 10.6% came from the cow-calf industry, 19.9% came from the Feedlot industry, and 69.6% came from beef processing. The total sales stemming from the beef industry amounted to $5.85 billion. As stated earlier the sales figures including double counting and do not reflect the final value of goods and services associated with the beef sector. Gross State Product associated with the beef sector and the true **economic contributions of the sector amounted to $2.08 billion**. Roughly 14.6% of the sector contributions were attributed to cow-calf operations, 17.1% were attributed to feedlots and 68.3% were attributed to beef processing. Total incomes from these industries were $1.45 billion that were received in the form of Salaries, Wages, and Benefits, as well as proprietor earnings[6]. This income supported 17,172 full time equivalent jobs within the state.

[6] Proprietor earnings only include labor income to farmers and do not include business profits. The underlying data show reduced income reporting but higher profits for the analysis year.

Table 4.2: *Top Industries in Washington Affected by the Beef Sector by Measure*

IMPLAN Code	Industry	Sales	Gross State Product	Income	Jobs
399	Truck transportation	$311,102,470	$165,925,817	$122,032,598	1,347
14	Animal production, except cattle and poultry and eggs	$263,503,746	$250,906,011	$234,249,629	1,567
383	Wholesale - Other nondurable goods merchant wholesalers	$224,301,669	$134,957,147	$47,349,269	491
59	Other animal food manufacturing	$189,285,341	$20,086,951	$11,070,088	116
2	Grain farming	$89,062,053	$14,622,349	$51,768,081	199
429	Other real estate	$66,421,616	$33,436,738	$12,146,136	252
381	Wholesale - Grocery and related product wholesalers	$63,858,377	$34,496,977	$19,109,764	218
451	Management of companies and enterprises	$60,378,518	$35,040,674	$86,936,619	278
146	Petroleum refineries	$57,378,283	$13,603,457	$3,294,687	6
472	Hospitals	$36,493,631	$22,153,109	$18,296,347	143
19	Support activities for agriculture and forestry	$35,312,685	$29,224,528	$28,185,972	643

5. Conclusions

The economic contributions of the beef sector remain strong. The sector as a whole produced over $509.45 million in direct value-added economic contribution for the state. That represents dollars that would not have existed in the state without the sector's activity and critical exports, which bring new dollars into the economy. Those added dollars to the state then circulate in the economy traveling backwards through the beef sector's supply chain, supporting another $1.05 billion in indirect, business-to-business, value-added transactions. Employee income is also spent in the state's economy, generating activity in those industries that support household purchases such as food retailers, automotive maintenance, electricity, etc. Those household-to-business expenditures and the associated ripple effects generate approximately another $517 million in value-added. The entire beef sector in Washington is responsible for just over $2.08 billion dollars in economic activity and supports over 17,000 full time equivalent jobs.

The packing sector accounts for just over 68% of the total economic contribution. The packing industry is highly concentrated and highly competitive economically, processing a large inventory of cattle with low margins. There are two major beef packers in the state. Any economic threat to the packing sector could have an enormous impact to the beef industry statewide. Table 5.1 shows the economic contributions of the sector by industry. We have highlighted the Gross State Product column as it represents the financial economic contributions of the sector.

Table 5.1: *Economic Contributions by Beef Sector Industry and Measure*

Beef Sector	Sales	Gross State Product	Income	FTE Jobs
Cow-calf Ranches	$3,126,271,755	$509,446,113	$388,409,195	6,414
Feedlots	$1,941,313,759	$1,054,012,386	$815,535,438	7,520
Processing Sector	$778,468,886	$517,045,469	$250,761,088	3,238
Total	***$5,846,054,400***	***$2,080,503,968***	***$1,454,705,722***	***17,172***

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Appendix 1: Survey Data to Input-Output Vectors

Table A1.1: *Cow-calf Production Functions and IMPLAN Vector*

Sector	IMPLAN ID	IMPLAN Description	Total
Inputs			
Hay	10	All other crop farming	$44,508,419
Grain	59	Other animal food manufacturing	$4,159,955
Salts and minerals	29	Other nonmetallic minerals	$12,711,000
Veterinary medicines	164	Pharmaceutical preparation manufacturing	$11,596,000
Veterinary services	449	Veterinary services	$3,791,000
Trucking services	399	Truck transportation	$4,513,520
Fuel	382	Wholesale - Petroleum and petroleum products	$7,994,207
Reproduction bulls	19	Support activities for agriculture	$18,144,599
Repairs	497	Agricultural machinery and equipment maintenance	$22,848,974
Supplies, misc.	252	Farm machinery and equipment manufacturing	$7,822,932
Sales commissions			$22,926,630
Check-off and marketing	447	Advertising, public relations, and related services	$878,620
Insurance	427	Insurance agencies, brokerages, and related activities	$11,501,225
Professional services	445	Technical consulting services	$773,285
Rents and leases	429	Other real estate	$6,868,400
Value Added			
Employee compensation	5001	Employee Compensation	$20,070,000
Proprietor Income	6001	Proprietor Income	$179,830,877
Other property income	7001	Other Property Type Income	$43,163,789
Indirect business taxes	8001	Taxes on Production and Imports	$34,419,133
Total			$458,522,565

Table A1.2: *Feedlot Production Functions and IMPLAN Vector*

Sector	IMPLAN ID	IMPLAN Description	Total
Inputs			
Feeder cattle purchases			$779,269,782
Hay	10	All other crop farming	$43,427,134
Grain	59	Other animal food manufacturing	$63,271,641
Salts and minerals	29	Other nonmetallic minerals	$1,139,911
By product feed			$73,405,277
Veterinary medicines	164	Pharmaceutical preparation manufacturing	$18,441,688
Veterinary services	449	Veterinary services	$1,534,643
Trucking services	399	Truck transportation	$5,412,344
Fuel	382	Wholesale - Petroleum and petroleum products	$5,559,022
Repairs	497	Agricultural machinery and equipment maintenance	$7,623,800
Supplies, misc.	252	Farm machinery and equipment manufacturing	$2,083,643
Check-off and marketing	447	Advertising, public relations, and related services	$1,362,810
Insurance	427	Insurance agencies, brokerages, and related activities	$2,270,247
Professional services	445	Technical consulting services	$922,901
Value Added			
Employee compensation	5001	Employee Compensation	$48,506,985
Proprietir Income	6001	Proprietor Income	$88,449,845
Other property income	7001	Other Property Type Income	$7,364,486
Indirect business taxes	8001	Taxes on Production and Imports	$551,439
Total			$1,150,597,600