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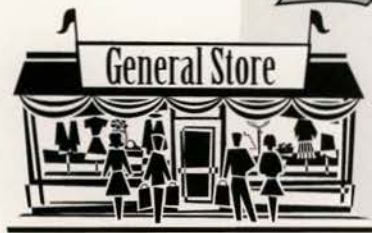
The Contribution of the

Agribusiness Industry

to Idaho's Economy

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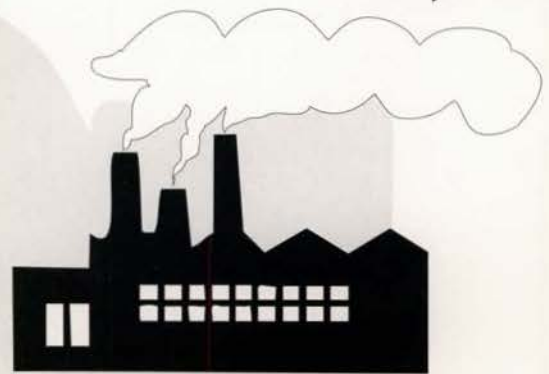


Farm

41,000 jobs
\$1.3 billion value added

Impact on Idaho

105,000 Jobs
\$4.0 billion value added



Ag Processors

18,000 jobs
\$954 million value added



\$2.2 billion Ag

Exports

\$3.4 billion Ag Processors

University of Idaho



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Idaho's economic roots are planted in agriculture. Agriculture has grown from modest family farmsteads into a giant agribusiness industry, providing jobs in Idaho and products for national and international markets. In 1998, agribusiness sold more than \$8 billion of goods and services and created employment for close to 60,000 Idahoans, who earned just under \$1 billion in wages and salaries. The value added generated by the agribusiness industry in Idaho's economy was approximately \$2.3 billion.

The impact of agribusiness industry echoes throughout the state's economy. Using multiplier analysis, the total impact of agribusiness on Idaho's economy in 1998 was estimated to exceed 100,000 jobs. More than 16% of the non-government jobs in Idaho are directly or indirectly dependent on agribusiness. More than \$4 billion, or 16% of the value that businesses add to Idaho's economy, is directly or indirectly attributed to the agribusiness industry.

What Is Agribusiness?

Idaho agriculture is an agribusiness.

Agribusiness is an industrial complex—a group of industries engaging in production, exchange, and marketing of food and fiber. Agribusiness is vertically integrated. The production and marketing channels of the agribusiness industry extend from farm suppliers to farmers and ranchers, food processors, through food retailers, ending with domestic consumers or international markets.

The farm is the critical intermediate link in Idaho's agribusiness complex, with "backward links" to farm suppliers and "forward links" to food processors. Backward-linked to production agriculture are those businesses whose primary customers are farmers, farm service and suppliers (e.g., aerial pesticides or fertilizers), agricultural chemical manufacturers, and farm equipment dealers. Businesses that supply goods and services to non-farm businesses are also backward linked to the farm. Stores, accountants, gas stations etc. are "backward" linked to production agriculture as well as other non-farm businesses.

The tentacles of the forward-linked segment of agribusiness extend throughout the economy into everyone's life. After all, we are talking about food—and everyone eats. The first forward-linked industries are the agricultural processing industries—meat, grain, food, cheese, and processed livestock feed. In turn, food retailers and even restaurants are forward linked to processors, and thus to agriculture. Even though restaurants and grocery stores are defined as forward-linked agribusinesses, they are excluded from our measures of the economic contribution of the agribusiness industrial complex. We draw the line on inclusion of forward-linked agribusinesses in our impact analysis, based upon the degree of import substitution. Grocery stores in Idaho would sell potatoes even if Idaho did not grow potatoes. If potato production ceased in Idaho, grocery stores would be stocked with imported potatoes, and thus the loss of potato growing in Idaho would have

negligible impact on grocery stores. In contrast, the cheese or sugar processing industry would be nonexistent in Idaho if not for the contributing dairy and sugar beet farmers, respectively. Thus, Albertson's supermarkets are out; Simplot potato processing is in.

"the total impact of agribusiness on Idaho's economy in 1998 was estimated to exceed 100,000 jobs"

Grocery stores and restaurants can be defined as an agribusiness, but these businesses are not included in the measures of contribution of agribusiness industry to Idaho's economy. However, many of the large grocery corporations have food processing divisions that do contribute to the agribusiness industry. Only the food retailing divisions of these large grocery chains are excluded from the measures of economic contribution.

To delineate the agribusiness industrial complex from other businesses in Idaho, businesses were grouped into one of eleven industrial sectors, ranging from Production Agriculture to Professional Service businesses. The industries within Idaho's agribusiness complex and other industrial groupings are defined in the Appendix. Most industry definitions are self-explanatory. The definition for High Tech and Manufacturing require elaboration: High Tech is defined as the manufacturing and services (excluding telephone) associated with electronics; Manufacturing is a mammoth "catchall" category that includes every business that produces goods outside of agriculture or high technology. The acronym F.I.R.E. represents finance, insurance, and real estate industry.

Impact versus Size

Industry size is not synonymous with economic impact. Look at the example of a bullet; a bullet's impact greatly outweighs its size.

The size of the agribusiness complex, whether measured by employment, value added, or sales, is related to the number of jobs or sales directly created by the farmers and agricultural processors in Idaho's economy. A farm worker, a bale of alfalfa, and property taxes (jobs, output, and value added, respectively) all measure the size of agribusinesses. Idaho's GSP (gross state product), and employment figures are regularly published measures of size. We measure size by the contribution agribusiness makes to value added, employment, gross sales, and exports. Measuring industry size is an accounting task—tallying the number of people

employed, the total sales, or the total valued added created by each industry.

Impact says something entirely different. Impacts depend upon the interrelationships between non-basic and base industries in an economy. Some businesses exist entirely to service other businesses. These businesses are the non-basic industries for the economy. Other businesses, whose sales are largely exported outside Idaho, form the export base of the state's economy. Impact attributes the portion of the non-basic business to the existence of the exporting (base) business. An agricultural example of non-basic and base is Idaho's dairy industry. Alfalfa hay is grown primarily to supply the dairies within Idaho, and thus is a non-basic industry. The dairy industry in turn supplies milk to processors in Idaho. Thus, the hay and dairy (non-basic industries) contribute to the impact of an exporting or base industry, the milk processors.

The impact of the agribusiness industry is measured by the industry's impact on Idaho's economy. That total impact can be divided into the direct and indirect. The direct impacts are the jobs, value added, and sales that are directly created by production agriculture and agricultural processors as a base (export) industry. The portion of employment, or value added, tied to the export of agricultural products is the direct impact of agribusiness. The portion of the agribusiness industry that is a service to other business is not a direct impact of the agribusiness, but rather is included in the impacts of the other base industries.

The indirect impact of the agribusiness industry is the impact on non-basic Idaho businesses that provide goods or services to the agribusiness complex. The indirect impacts are so labeled because they result from a ripple or multiplier effect of the agribusiness industry. Multiplier effects are driven by the exports of an economy. Exports (new money coming into an economy) ripple throughout the economy as each business seeks to fulfill the demands of its customers. An increase in agricultural exports increases the direct impact of farms. When farm exports increase, farmers create the indirect impact as they purchase more fuel, fertilizer, machinery, and labor to meet the increased demand for agricultural exports. Similarly, the non-basic businesses create an indirect demand for goods and services from other businesses in the economy to be able to supply inputs to farms. When other businesses find their demand for goods or services rising, they too will buy more inputs, and thus the original export change ripples throughout the economy. These reverberations wane as a portion of each round of spending leaks out to savings, taxes, and imports. The greater the "leakage," the faster the effects die out and the smaller the multiplier. In summary, impact is propelled by exports and could be more accurately labeled as the "impact of exports." And the impact of an industry upon the economy is the product of the industry's multiplier and the industry's exports. The

total impact of agribusiness on the state's economy is the sum of direct and indirect impact. The Appendix discusses in greater detail industry impact versus industry size and the methods to measure the impacts of agribusiness industry in Idaho.

Contribution of Idaho's Agribusiness Industry

Contribution is measured by size and impact of the agribusiness industry. There are many economic metrics of size or impacts. The specific aspects of Idaho's economy we used to measure the contribution of agribusiness are: 1) value added, 2) employment, and 3) gross sales (of which export sales are a category). Industry size was measured by counting the number of people employed, the total sales, or the total valued added created by each industry. An industry's impact was measured by combining the multiplier with respective exports.

Business Sales

Production agriculture is the cornerstone for Idaho's agribusiness complex. Idaho ranks 24th in the nation in the value of cash receipts from production and marketing of crops and livestock (*Idaho Agricultural Statistics*). Obviously, the "big four" agricultural states of California, Texas, Iowa, and Nebraska rank higher than Idaho, as do most of the midwestern and southern states. Idaho has some "superstar" crops, ranking first nationally in potato production, second in sugar beets, and third in barley, mint, hops, and onions. The diversity of Idaho agriculture is remarkable. Lacking the temperate climate of California, Texas, or Florida, Idaho's agricultural portfolio is far more diverse than the large Midwest agricultural "cornbelt" states. What gives Idaho agriculture its impact is not its sheer size, but rather the magnitude of the forward linkages. Idaho's principal agricultural products—potatoes, beef, and milk—create additional economic benefits in the forward-linked processing industries. In contrast, many of the midwestern states export their major farm products (corn, wheat, and soybeans) without processing.

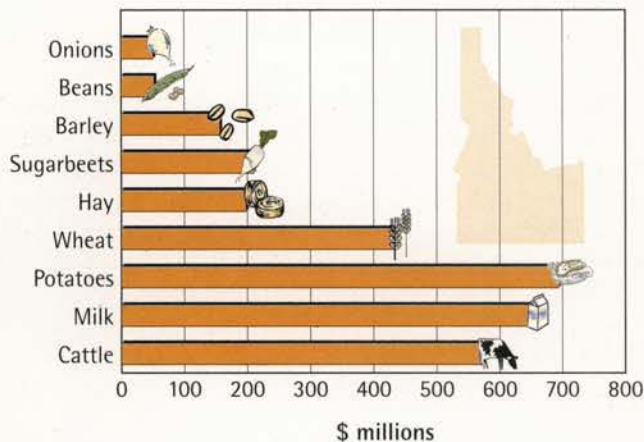
The total value of Idaho's agricultural production in 1998 exceeded \$3.6 billion. The main agricultural products were milk, cattle, and potatoes. However, crop and livestock economic data are not directly comparable. Crop production is reported as the value of production, while livestock and livestock products data are based on cash receipts from farm marketing. In 1998, total cash receipts from the sale of all animal agricultural products was just under \$1.6 billion. Marketing of cattle and cattle products account for \$653 million; milk and sales exceeded \$829 million. The total value of crop production in Idaho in 1998 exceeded \$1.7 billion. Of course, potatoes are Idaho's leading crop, with sales exceeding one-half billion dollars in 1998. Following potatoes were: wheat at \$269 million; hay, \$248 million; and sugar beets, \$219 million. Government payments and other

miscellaneous sources of income constitute the difference between crop and livestock sales and total agricultural output.

Business output can be visualized as gross sales. The term gross output, however, is more accurate because some businesses use goods of their own manufacture. For example, a farmer grows hay, which then is fed to his/her own cattle. The gross value of hay is recorded as output, even when the hay is not sold. For trade businesses, gross sales are defined as the mark-up, net of the cost of goods. As separate industries, agriculture and agricultural processing are of comparable rank in gross sales with other Idaho business sectors. When combined into the agribusiness complex, approximately one

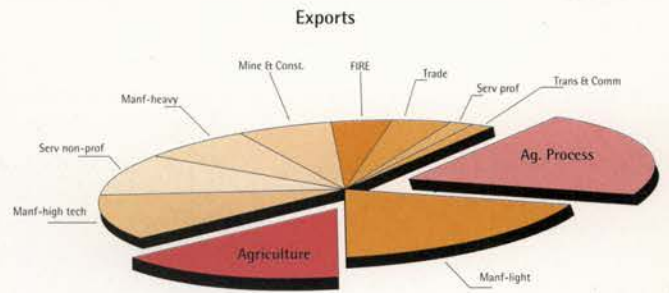
Agribusiness is the cornerstone of Idaho's foreign and domestic export base because exports dominate the

Idaho's Leading Farm Products, 1996



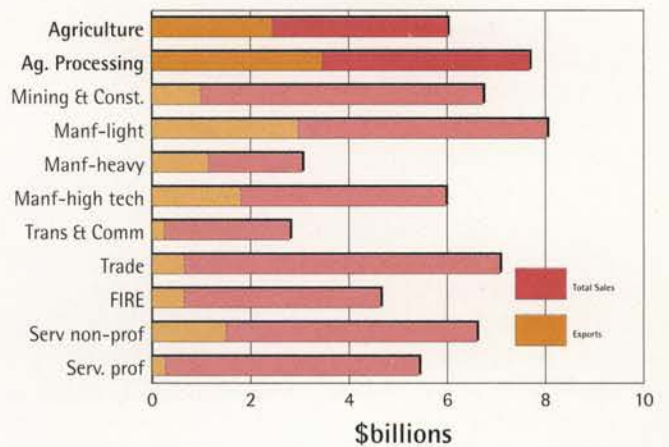
in every six dollars of sales in Idaho is made by agribusiness. In 1998, Idaho's agribusiness complex sold an estimated \$8.3 billion of goods and services. Agribusiness contributes more to Idaho business sales than the catch-all Manufacturing industry. Following agribusiness, gross sales are spread among the Manufacturing, High Tech, Trade, Mining and Construction, and Service industries. Each of these sectors account for 9-16% of the state's total sales.

Sales are made either to customers within Idaho or customers outside Idaho (exports). Exports are of particular interest because sales to export customers are the driving force for an economy. Why driving force? Because exports provide the new money from outside Idaho's economy, fueling purchases from other businesses within Idaho or stimulating imports. Exports are sales of goods and services to customers outside Idaho—to other states as well as international markets. In 1998, foreign and domestic exports from Idaho exceeded \$22 billion. More than one-fourth (27%) of the exports from Idaho are from the agribusiness industry. Agribusiness exports rank second to our catchall Manufacturing sector. Agribusiness exports even exceed High Tech exports (22%), which rank third in the state. Exports from the non-basic industries are far less. The combined exports from the Transportation and Communication, Services, Trade, and Finance industries are less than half that of the agribusiness industry.



agribusiness industry's total sales. Exports comprise 61% and 81% of the agriculture and agricultural processing total sales, respectively. Idahoans simply cannot consume the agricultural abundance produced in the state. Exports from production agriculture are a lesser proportion of total sales than processed agricultural products because agriculture sells products to other farmers and to processing. Much of milk, cattle, sugar beets, and potatoes are forward linked to agricultural processors within Idaho, not exported as raw agricultural products.

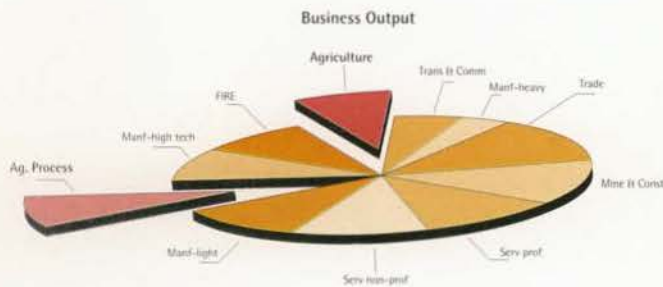
Exports vs. Idaho Sales



The High Tech industry is the extreme example of an industry dependent on export markets, selling virtually all (97%) of its production out of state. As with food and fiber products, Idaho consumes only fraction of the High Tech products and services produced in the state. At the other extreme, only a fraction of the total sales of the Transportation and Communication, Services, Trade, and Finance industries are to export markets. These non-basic businesses exist to service export-based businesses and consumers. Evidently, Idaho's largest trade center, Boise, does not attract customers from outside Idaho.

Agribusiness is the customer base for many businesses across the state. The local farm implement dealer is a visible example. Not as obvious are the numerous other backward-linked businesses that sell to the agribusiness complex. Examples include, accountants for farmers and ranchers;

bankers making loans to farmers and processors; and utilities that sell electricity to farmers and processors. Also not visible are the businesses for whom agribusiness is an indirect customer. Indirect sales are not sales made by farmers or cheese processors directly, but rather hidden sales as the multiplier effect of the agribusiness industry ripples throughout Idaho's economy. The multiplier effect (Appendix Table 1) measures the total (direct plus indirect) backward linkages of agribusiness; i.e. the sales impact on businesses that sell directly to farmers, plus the impact on sales of any connected business. The backward-linked impacts reverberate within the agribusiness industry and ripple to other businesses in Idaho's economy. The dairy industry sells a majority of the fluid milk to Idaho cheese processors, not to export markets. Having minimal exports, the dairy industry would appear to have little impact on the Idaho economy. Rather the dairy industry impact on Idaho's economy is recorded through the forward-linked cheese processor, whose sales are almost entirely to export markets.



The impact of agribusiness, driven by its exports, recorded a total impact of \$13 billion in sales of goods and services in 1998. The total sales impact is comprised of \$6 billion of direct impact plus \$7 billion of indirect impact. In other words, the agribusiness industry sells \$6 billion of goods and services (exports of wheat to China or cheese to California) and \$7 billion of indirect backward-linked sales. The \$6 billion of direct sales ripple throughout Idaho's economy to create an additional \$7 billion sales impact of goods and services. Of that \$7 billion, \$2.5 billion can be attributed to agriculture and \$4.5 billion to agricultural processing. Agricultural processing has greater indirect impact because these businesses export the processed agricultural products which are first purchased from Idaho farmers. To return to the example of dairy and cheese processors, the indirect impact of dairy would be minimal because few dairies export raw milk. The indirect impact of the dairy industry would be attributed to the cheese processors because virtually all cheese is exported. This illustrates an earlier assertion that agribusiness impacts are amplified by because Idaho's agricultural abundance is processed within the state rather than exported.

Not only can we quantify the total impact of the agribusiness industry, but we also can trace the indirect impacts to each industry via multiplier analysis (see Appendix

Table 2). Further, the indirect impact can be bifurcated into the impact attributed to agriculture versus agricultural processing. Industries incurring the greatest indirect sales impact are Trade, followed by Non-professional Services, Professional Services, and F.I.R.E. The indirect sales impact of agribusiness are concentrated in the stores, banks, and service businesses that we think of as "Main Street" businesses. In Professional Service businesses (doctors, lawyers, accountants, etc.) agriculture's indirect sales impact is \$160 million and the indirect sales impact from food processing is \$420 million. In total, agribusiness's indirect sales impact is \$580 million for Professional Service businesses. The industries least impacted by agribusiness are the Manufacturing and High Tech industries. Manufacturing industries are not strongly backward-linked to agribusiness. The sales impact of agribusiness upon the High Tech industry is barely \$3 million.

The greatest indirect sales impact of the agribusiness industry is the feedback upon the agribusiness industry itself (see the above chart). The indirect sales impact of the agribusiness industry back upon the agribusiness industry totaled \$1.4 billion in 1998. Of the agribusiness total, \$1.1 billion is the indirect sales impact of agriculture and \$300 million is the indirect sales of agricultural processing. And of agriculture's total, \$284 million stems from agriculture, and \$826 million is attributed to food processing. Two examples demonstrate the origin and magnitude of these numbers. An example of the indirect sales impact agriculture has upon agriculture would be when an alfalfa farmer sells hay to a rancher who then sells calves to export markets. The hay sales are thus an indirect impact of the cattle exports. While the sales of agricultural products to other agricultural producers are large, the impact of agricultural processing upon agriculture is even greater. The most prevalent example in Idaho is the backward linkages of cheese processors to the dairy industry. Cheese exports have an impact on milk production. If cheese exports ceased, the backward-linked dairy industry would suffer the indirect sales impact.

To summarize the contribution of agribusiness to gross business sales in Idaho, the agribusiness complex produced more than \$8 billion of goods and services, which indicates the size of the agribusiness industry. In contrast, when agribusiness exports ripple throughout Idaho's economy, the total impact upon gross sales in the state was close to \$13 billion.

Employment

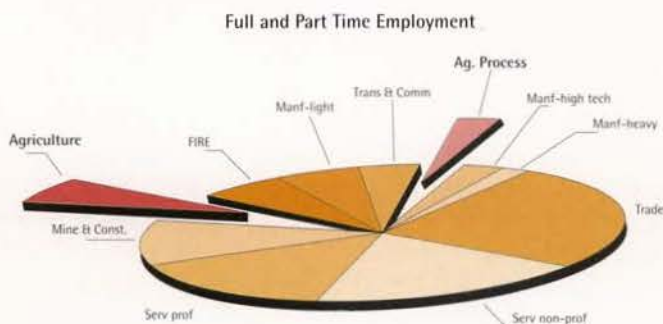
Jobs or employment is defined as full- plus part-time employment. As separate industries, farming and food processing are not prominent employers. The agribusiness complex, however, employs close to 60,000 full- and part-time workers. One in every 11 non-government Idaho workers are farmers or work in an agricultural processing business. Nine percent of the total employment in Idaho is in the agribusiness industry. Trade and Service businesses

(Trade, Non-professional Services, and Professional Services) are the Idaho's largest employers, at 162,000, 116,000, and 98,000 employees, respectively. These industries rank high in job creation because of their sheer size. Those industries also are highly labor intensive.

Jobs are directly created in the exporting industry or indirectly in backward-linked businesses. Employment is proportional to the output impacts—for every dollar of business sales, there is a constant number of jobs assumed. In effect, we assume that jobs-per-dollar of sales is constant, but not necessarily equal across all industries (as shown in Appendix Table 1). In effect, the employment multiplier is constant for a specific industry but varies across industries.

drive cattle trucks. It does mean, however, that loans and trucking are provided to other businesses that in turn support the agribusiness industry. This illustrates that the backward linkages of agribusiness extend beyond the readily identifiable agricultural services to encompass every industry in Idaho.

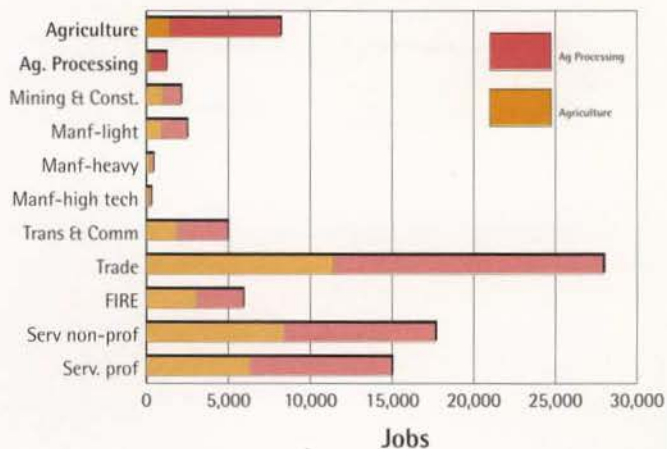
Indirect employment impact is not equal across industries. Trade and Non-professional Services rank as the top two industries in terms of the indirect impact of agribusiness employment. Indirect employment in the Trade industry alone constitutes almost one-third of agribusiness' indirect employment. Production agriculture ranks third in employment impacts. Agriculture incurs an indirect impact of 12,000 jobs, of which 3,000 result from agriculture itself and 9,000 from agricultural processing. The explanation for high indirect agricultural employment impacts follows that given for sales impacts. Agricultural processing is forward-linked to agriculture, and thus exports of processed agricultural goods impact all backward-linked industries, of which agriculture is the largest. On the heels of agriculture, Professional Service businesses rank fourth in indirect employment impact.



Agribusiness is a hidden employer. Hidden are those jobs indirectly created by agribusiness or the indirect employment impact of agribusiness as measured by multiplier analysis. One in every six business (non-government) jobs in Idaho is connected, either directly or indirectly, to agribusiness. The total employment impact of the agribusiness industry on Idaho's economy was more than 100,000 jobs in 1998; 14% of the state's total employment, or 17% of Idaho's non-governmental employment. Of the total full- and part-time job impact of agribusiness in Idaho, more than 60 percent is indirect, created by agribusiness exports rippling throughout Idaho's economy.

More than one-third of the total agribusiness employment impact (direct plus indirect) in Idaho is in production agriculture. One-fifth of the total agribusiness job impact is in the Trade industry; agricultural processing ranks third. Although impacts in the Trade industry are entirely indirect, they still are greater than in the agricultural processing industry. The service industries (professional and non-professional) follow agricultural processing in total employment impact. While the total impact in Transportation and Communication and the F.I.R.E. industry is less than in Trade and Services, the proportion of agribusiness' employment impact is equal to that of Trade. More than 10% of the jobs in the Trade, Transportation and Communication, Service, and F.I.R.E. businesses can be attributed to Idaho's agribusiness industry. This does not mean that one-tenth of the bankers are agricultural loan officers, or that one in 10 truckers

Indirect Job Impacts

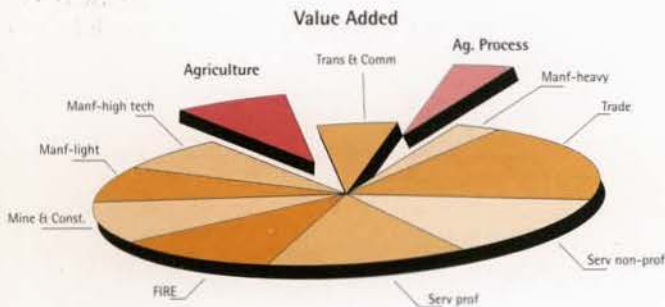


Agribusiness has a limited indirect employment impact on Idaho's Manufacturing or High Tech industries. Neither farmers nor processors purchase a substantial amount of manufactured goods from Idaho businesses that create indirect employment. Fewer than 20 High Tech jobs are indirectly created by agribusiness. In summary, the indirect employment impact of Idaho's agribusiness industry is felt on the "Main Street" businesses of Trade, F.I.R.E., and Services and upon agriculture itself.

In 1998, agribusiness in Idaho employed close to 60,000 full- and part-time workers. The total employment impact of agribusiness on Idaho's economy exceeded 100,000 jobs, or 17% percent of the state's non-governmental employment. Thus, one in every six jobs in Idaho business is connected, either directly or indirectly, to agribusiness.

Value Added

Value added is more than profit. Value added measures return above production costs, wages and salaries, income from sole proprietorships, and property income (dividends and interest, rents, and taxes). Value added, or returns to the agribusiness complex, ranks low in Idaho. Wages, profits, and taxes in agriculture have always been meager. In 1998, agribusiness contributed 8%, or \$2.3 billion, of Idaho's value added. Conversely, more profitable industries with a greater number of employees have higher value added. For example, Trade and Service (Professional and Non-professional) industries comprise 20% and 27% of the value added in the Idaho economy, respectively. Within the agribusiness complex, 60 percent of agribusiness' value added can be attributed to production agriculture. Despite the presence of the large agricultural processing industry in the state, farms and ranches dominate agribusiness' value added.

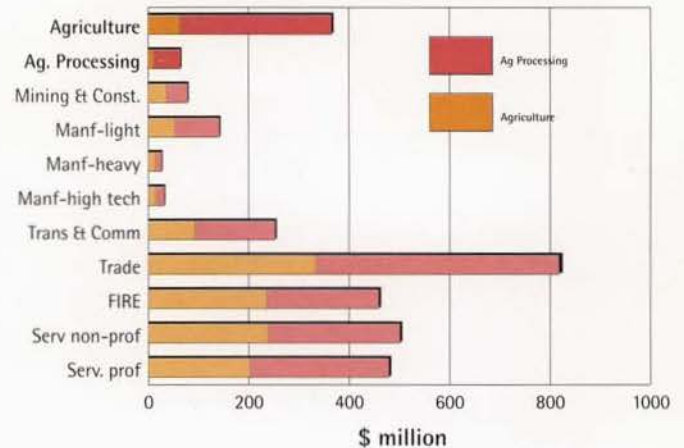


Value added is created directly in the exporting industry or indirectly in supporting or backward-linked businesses. As with employment, valued impacts are proportional to the output impacts; for every dollar of business sales, a constant portion of value added is assumed. We assume that profits, taxes, and wages are constant for each dollar of sales, but not necessarily equal across all industries. In effect, the multiplier for value added is constant for each industry but varies across all industries.

The total impact upon value added, or the direct and indirect value added created by the agribusiness industry, exceeds \$4.1 billion annually. Almost 14 percent of the value added in Idaho's economy can be directly or indirectly attributed to Idaho's agribusiness complex. Of the total value added impacts, production agriculture tops the list. More than 30% of the total agribusiness value added impact stems from production agriculture. Agricultural processing ranks second at 20%. Thus, more than one-half of agribusiness' total (direct and indirect) value added impact is from the agribusiness industry itself. Trade ranks third. Of course, the impacts in the Trade industry are entirely indirect.

Indirectly, many Idaho businesses owe a portion of their value added to agribusiness. Trade, agriculture, and

Indirect Value Added Impacts



the Service industries (Professional and Non-professional) ranked as the top four in agribusiness' indirect value added impact. Indirect value added in the Trade industry alone constitutes one-quarter of agribusiness' indirect employment impact. The \$640 million value added impact that agribusiness has upon Trade businesses can be bifurcated; one-third to agriculture and two-thirds to agricultural processing. In other industries, this proportion is even higher. Three-fourths of the indirect value added impact upon agriculture can be attributed to agricultural processing. Across all the industries, the indirect value added impact created by agricultural processing exceeds that of agriculture. This again illustrates the magnitude of the backward linkages of agricultural processing. Impacts are driven by the exporting industry; cheese exports thus impact value added in the backward-linked dairies. As with employment, value added in Idaho's Manufacturing industries is not highly impacted by agribusiness. At the extreme, agribusiness indirectly creates barely \$1 million of value added impact in the High Tech industry.

In 1998, the agribusiness industry in Idaho's economy added more than \$2 billion of value above production costs. The total direct and indirect value added that is created by the agribusiness industry, exceeds \$4 billion annually. Almost 14% of the value added in Idaho's economy can be attributed, directly or indirectly, to Idaho's agribusiness complex.

Data Sources

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Appendix

Measuring industry size is an accounting task, counting the number of people employed, the total sales, or the total value added created by each industry. To maintain consistent industry definitions, we report the size measures from the 1998 IMPLAN database, but we also could have used state Gross State Product (GSP) and state employment data.

Impacts depend on the interrelationships between non-basic and base industries in an economy. Some businesses exist entirely to service other businesses. These businesses are the non-basic industries. Other businesses, whose sales are largely exported outside Idaho, are the export base of the state's economy. Final demands, of which exports are the major component, drive an economy. They are the exogenous forces that bring new money into an economy. Exogenous forces include investment, government expenditure, and exports.

Impact attributes the portion of the non-basic business to the existence of the exporting business. We can illustrate the concept of impact, with an elemental economy comprised of two industries of equal size. The size of each—as measured by either employment, sales, or value added—is half of our rudimentary economy. The first industry is the export base of our simple economy, selling its entire output to export markets. The second industry is the non-basic industry whose entire services are consumed by the first industry. This example of simple economy illustrates that the size of each industry is half of the economy, but the second industry has no impact upon the economy. Contribution, as measured by impact, is attributed entirely to the first industry.

To assess the impacts of agribusiness, we construct a scenario in which agribusiness ceases to be an export base industry in Idaho's economy. In effect, we hypothesize exports (raw agricultural exports and processed food and fiber exports) from the agribusiness complex cease. The agribusiness industry would continue in its service role, providing goods and service to other business within Idaho. In other words, the exogenous force (final demands) would cease, but the endogenous supply (internal consumption) provided by agribusiness would continue. As implausible as this scenario sounds, it allows us to assess the impact of the agribusiness industry as a base industry. That impact is not confused with industry size.

Thus, multipliers determine how the direct change in final demand of a single industry ripples throughout all the other industries in a regional economy. An input-output model was constructed to measure the indirect economic impact (or the multiplier effect) the agribusiness complex has on other Idaho industries. The input-output model accounts for sales and purchases linkages between Idaho businesses in 1998. The input-output data source was the 1998 IMPLAN database.

The agribusiness complex buys goods and services from other Idaho businesses for operation and production purposes. Other businesses, in turn, buy goods and services from Idaho-based businesses to provide the goods and services demanded by the agribusiness complex. Numerous rounds of inter-industry transactions occur, resulting from direct purchases by agribusiness. Agribusiness transactions create a multiplier effect; a change in the output of the agribusiness complex generates or induces changes in the outputs of many other industries in Idaho's economy. Therefore, total economic activity or output increases by a multiple of the initial change in output. This multiplier, or impact, is captured in the commonly used economic multiplier concept.

Multipliers for the industries in Idaho's economy are shown in the following table. A multiplier measures the direct and indirect impact, or the total change in business sales, that occurs in response to a \$1 change in exports. Type I multipliers measure only the changes in business sales. Type II multipliers measure the change in gross sales plus wages, salaries, and proprietors' profits. Type II assumes wages, salaries, and proprietors' profits circulate through the economy, along with business transactions. Agricultural processing has the greatest Type I multiplier, 1.59. Thus, for every dollar of processed agricultural goods exported from Idaho, \$1.59 of sales are created in food processing and other businesses in Idaho. Food processing buys a significantly larger proportion than other businesses of inputs within Idaho to create exports. The more labor-intensive Trade and Service industries have larger Type II multipliers.

Table 1.

	Type I	Type II
Agriculture	2.10	1.47
Ag. Processing	2.15	1.59
Construction and Mining	2.10	1.30
Manufacturing	1.86	1.26
High Tech	1.79	1.20
Transportation & Communication	2.18	1.38
Trade	2.12	1.19
F.I.R.E.	1.83	1.23
Service, Non-Professional	2.14	1.29
Service, Professional	2.45	1.25

The magnitude of a state's imports determines the self-sufficiency of its economy. The more self-sufficient an economy is, the greater the multipliers for that economy. An industry with fewer imports circulates more of its purchases throughout the economy and thus has a greater multiplier. Imports are defined as purchases from outside Idaho, both foreign and domestic.

In 1998, the agribusiness complex purchased an estimated \$5.6 billion of goods and services from other Idaho businesses and imported \$2.7 billion of goods and services. The agribusiness industry spends 28% of its total expenditures on imported goods and services. In contrast,

Idaho's High Tech industry imports 44% of its total expenditures. The Manufacturing industries require raw materials that are available in Idaho. At the other extreme, the Finance, Insurance, and Real Estate industry imports only 11%.

The industry aggregation masks the variability of multipliers of individual industries. For example, the dairy industry, aggregated in agriculture, has a larger multiplier than the average for agriculture. Dairy purchases of locally grown feed increase the dairy multiplier.

The total change in business sales, reflected in the previous multipliers, can be traced to the impacts upon each sector of Idaho's economy. The total change in output (for all businesses and households in Idaho) for the change in processed agricultural exports is \$2.18. The total change can be distributed over the impacted industries. For example, the dollar change in processed agricultural exports increases the sales of Mining and Construction by just over two cents and feeds back to increase the sales of agriculture of 22 cents, and increases sales in the Trade by more than 15 cents. Thus, the impacts of changes in processed agricultural exports are most evident in Trade and Service and Households.

Table 2.

Industry	Agriculture	Ag. Processing
Agriculture	1.129	0.218
Ag. Processing	0.039	1.065
Mining and Construction	0.032	0.022
Manufacturing	0.003	0.005
High Tech	0.001	0.001
Transportation & Communication	0.055	0.064
Trade	0.134	0.152
F.I.R.E.	0.104	0.067
Service, Non-Professional	0.127	0.089
Service, Professional	0.073	0.111
Households	0.443	0.393
Multiplier Type II	2.14	2.18

In summary, the impact of the agribusiness industry are modeled by setting the final demands of the production agriculture and agricultural processing sectors to zero and assessing the impact with respective multipliers of agriculture and agricultural processing. Thus, an industry's

impact upon the economy is comprised of two parts—the magnitude of the multiplier and the magnitude of the exports.

Idaho's Sector or Industry Delineation

Sector or Industry	Example Businesses
Production Agriculture Industry	Crops and Livestock
Agricultural Processing Industry	Canned, Frozen, Preserved Fruits and Vegetables Food Specialties Fats and Oils
Mining and Construction	Metal and Coal Mining Oil and Gas Extraction Residential and Nonresidential Building Contractors
Manufacturing Light	Textile Manufacturing Furniture and Fixtures Drugs and Chemicals Products
Manufacturing Heavy	Transportation Equipment Farm and Garden Equipment Transformers, Pumps and Motors
Manufacturing Hi-Tech	Computers Surgical and Medical Instruments Engine Electrical Equipment
Transportation and Communication	Air and Railroad Transportation Motor Freight Transportation Telephone and Telegraph Communications
Trade	Wholesale and Retail Trade Food Stores Apparel and Accessories Stores
F.I.R.E.	Finance and Depository Institutions Insurance Agents Real Estate Operators
Service Non-professional	Hotel and Lodging Services Automotive Repair Services Miscellaneous Repair Services
Services Professional	Health Care Services Legal Services Education

The High Tech industry was defined as the SIC codes represented by High Tech industries trade association (AEA). The exception was that telephone communications was aggregated with the Transportation and Communications industry.



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