May 2006

EDR 06-08

Economic Development Report

Colorado State University Extension

Department of Agricultural and Resource Economics, Fort Collins, CO 80523-1172
http://dare.colostate.edu/pubs

THE ECONOMIC CONTRIBUTION OF THE COLORADO WINE INDUSTRY

Dawn Thilmany, Phil Watson, and George Kress [1]

- *Colorado reported approximately $11.8 million in wine sales for the 2004/05 production year. Wine grapes accounted for $1.3 million of this value.*
- *Colorado wine sales lead to a broader economic contribution of $21.1 million (including returns to wine grape producers and other inputs and services purchased from local businesses).*
- *When accounting for wine-based tourism, another $41.7 million is contributed including tasting room and educational visits. This economic activity may of increased given new activities (Wine Trains) and recent growth in attendance at tasting rooms and the Colorado Mountain Winefest.*
- *U.S. wine sales grew by 12 percent per year over the past decade: double the general economy's growth. The wine industry reported $16.5 billion in sales for 2005.*[2]

The wine industry appears to be experiencing robust sales growth, both in terms of consumption per person and prices received for wine. More and more consumers are developing a passion for wine as the baby boomer generation gets older and has more disposable income. Since the mid-1980's, consumption rates have increased by double-digits for the premium wine segment. This study provides a brief overview of the economic role of the wine industry in Colorado, with some integration of a similar report focused on the primary wine growing area, Mesa County. After presenting underlying sales and production data, an estimate of the wine industry's economic contribution to Colorado is presented.

Wine Industry Trends

According to the Wine Institute, US wine consumption totaled 668 million gallons in 2004, up from 570 million gallons in 2000. In 1999, per capita wine consumption was over 2 gallons per person[3] while another study reported 8.77 litres (or 2.3 gallons) per capita for 2001.[4] This number grew by 10% per year between 1997 and 2000. With respect to dollar value, wine sales are growing at a compounded annual rate of 12 percent: double the general economy's growth. In terms of sales, the industry reports $16.5 billion in retail value for 2005,[5] or $56 per capita per year.

[1]Associate Professor and Graduate Research Assistant, Department of Agricultural and Resource Economics; and Professor Emeritus, College of Business, Colorado State University, Fort Collins, Colorado.

[2] http://www.wineinstitute.org/communications/statistics/sales2005.htm

[3] http://www.wineinstitute.org/communications/statistics/consumption1934_99.html

[4] http://www.wineinstitute.org/communications/statistics/keyfacts_worldpercapitaconsumption02.htm

[5] http://www.wineinstitute.org/communications/statistics/sales2005.htm

The potential for wine production as an economic development driver is of interest to a growing number of states throughout the country. Wine production, which typically adds value of approximately $2-$4 for each $1 of farm gate value, is closely integrated with grape growing operations. Wineries with tasting rooms contribute another $4-$10 per $1 of farm gate value to the rural economy by selling their wine directly to consumers.[6]

Colorado is a growing presence in the Intermountain West, even if it is only a small part of the US industry. A 2004 study by CSU Cooperative Extension estimates that there are 750-850 acres in wine grape production among 130 growers (with 650 acres consistently producing and processing/selling to the wine market). This production is almost evenly split between contract growers and wineries. Yet, far less is known about the importance of this growing industry to the Colorado economy in general, and more specifically, affiliated tourism activity that may significantly extend the impact of the wine industry to the economy.

This study attempts to, first, describe the economic size and scope of Colorado's wine industry and, secondly, to analyze the impact of tourism on the Western Slope of Colorado, and more broadly, the Colorado economy. Using surveys given to consumers of the Colorado wine industry, as well as surveys sent to each wine grape grower and winery, direct and indirect contributions of the industry are estimated.

WINE PRODUCTION IN THE U.S.

According to *2004 Economic Impact of California Wine*, written by the MKF Group, the United States ranks fourth in total worldwide wine production (Figure 1). The total 2001 worldwide production of wine was estimated to be just over 7 billion gallons, with the U.S. supplying almost 680 million gallons. California is by far the largest producer of wine in the US, accounting for over 90% of total domestic production. Behind California, New York and Washington both have sizeable wine production (Figure 2). Thus less than 3% of U.S. wine is produced in the other 47 states, and based on 2004 national data, Colorado's wine production ranked 22nd.

According to USDA data, total U.S. wine production decreased 76 million gallons in 2004 to a level of 604 million gallons. This reduction was primarily due to the almost 85 million gallon reduction in wine production in California, with other states actually increasing production over this time period.

Wine is now produced in every state, and although three states dominate production, wine sales growth is significant in many others. The U.S. grape crop has more than tripled in 15 years from $955 million in 1985 to almost $3 billion in 2000. Wine grapes have increased far faster than the overall grape crop and now represent almost 2/3 of total grape production. Grapes are the highest value fruit crop in the nation and the seventh largest crop overall. As vineyards continue to expand, so do the number of wineries who use the wine grapes as inputs. There are currently more than 3,000 wineries with at least one in each of the fifty states.

The economic activity directly generated by the US wine industry creates an increasing number of jobs, wages and economic activity as services are purchased and wages are spent. In aggregate, MKF reports that the wine industry contributes more than $45 billion to the U.S. economy, along with 556,000 jobs, which account for $12.8 billion in wages and $3.3 billion in state and local tax revenues.

Other states have attempted to assess the economic contributions of their respective wine industries. A similar study released by New York's wine industry in 2005 showed a $3.3 billion impact in that state and note that the industry contributed 23,000 jobs[7] to New York's economy. In Washington, the wine industry affects the state economy by $2.4 billion annually, employs more than 11,000 people statewide and directly paid $34 million in wages[8] when taking grape and wine production into consideration.

The California wine industry has an annual impact of $45.4 billion on the state's economy, growing nearly 40 percent from 1998 to 2002, and producing the number one finished agricultural product in the state, according to the Wine Institute and California Association of Winegrape Growers. The MKF research indicates that the California wine industry and its affiliated

[6] http://www.wineamerica.org/newsroom/winefacts04.htm
[7] http://www.newyorkwines.org/articles.root/799/MKF-917.pdf
[8] http://www.wawgg.org/index.php?page_id=69

businesses provided 207,550 full-time equivalent jobs, with a total of $7.6 billion in gross wages. In California, more than 62,500 jobs were added at an annual growth rate exceeding nine percent during a period of rising unemployment.[9]

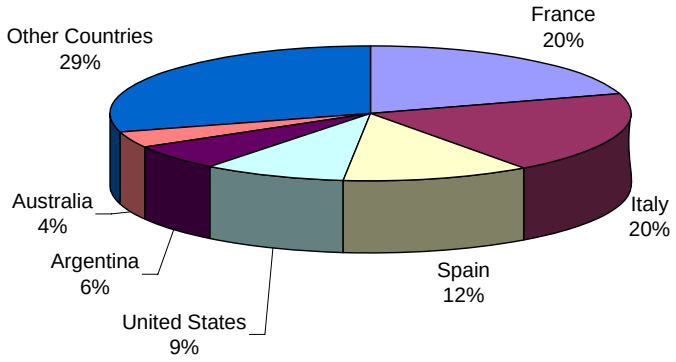


Figure 1 – 2001 World Wine Production by Country (7.05 Billion Gallons)

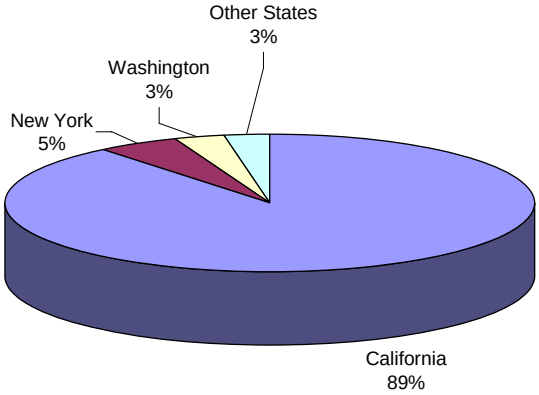


Figure 2 - 2004 U.S. Wine Production by State (640 million gallons total)
Source: Wine Book 2005

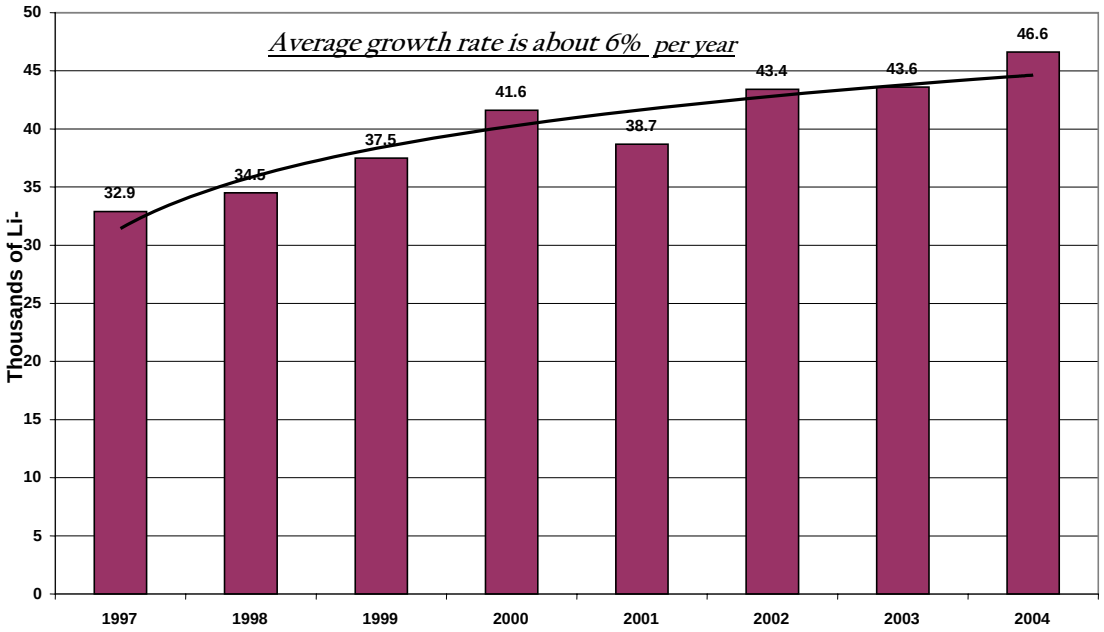
[9] http://www.wineinstitute.org/communications/statistics/Economic%20Impact%20Report%202004.htm

WINE CONSUMPTION IN THE US & COLORADO

Another important element of defining the size and potential for the Colorado Wine Industry is assessing the wine consumption among its residents.[10] Although Colorado's population, 4.6 million, is only 1.56% of total U.S. population, it accounts for 1.86% of U.S. wine sales. In 2004 Colorado ranked 16th among all 50 states in terms of total wine consumption. The per capita consumption of wine among Colorado adults in 2004 was 3.66 gallons, almost 20% greater than the 3.06 gallons per capita consumption among all U.S adults. In 2004, 46.6 million liters of wine were sold in Colorado (Figure 3).

Another difference between Coloradans and the average U.S. wine consumer is in the nature of our consumption. Colorado consumers report buying a much higher proportion of domestic wines than imported wines: 75.4% of the wine consumed in the U.S. is "Domestic," while 86.9% of the wine consumed in Colorado is "Domestic".

Table I shows that Coloradans also differ from the U.S. average in the types of wines consumed. Over 94% of wine consumed in Colorado is table wines compared to the 90.6% of table wines reported as the US consumption rate.



Source: Colorado Wine Industry Development Board

TABLE I
Types of Wine Consumed, U.S. vs. Colorado

Type of Wine	Colorado (%)	U.S. (%)
Table Wine	94.2	90.6
Wine Coolers	0.4	0.2
Champagne/Sparkling	3.5	4.8
Dessert/Fortified	1.6	3.7
Vermouth/Aperitif	0.3	0.7
TOTAL	100.0	100.0

Source: Adams Wine Handbook, 2005

[10] Most of the information in this section was obtained from the book: "Wine Handbook—2005" published by the Adams Beverage Group.

The wine industry uses a Category Development Index (CDI) to compare each state's per capita consumption of various categories of wines. This index is normalized at 100. Thus if a state receives a CDI of 120, that means its per capita consumption is 20% higher than the U.S. average. A CDI of 85 indicates that state's per capita consumption is 15% lower than the U.S. average. Table II identifies Colorado's consumption indexes in five key wine categories. Those data further illustrate the state's relatively high consumption of table wines along with a surprisingly high consumption of wine coolers, suggesting where Colorado wineries may want to focus future product development.

A recent national study of 1300 U.S. adults, sponsored by the Wine Market Council, found that "Core" wine drinkers (people who drink wine at least once a week) account for almost 87% of the wine consumed in the U.S. Although the size of this group has increased by 38% since 2000, it still comprises less than 14% of the total U.S. adult population. "Marginal" wine drinkers (people who consume wine at least every three months) comprise another 18.9% of the adult population (Table III). The Core wine drinkers may be an attractive segment to target for the Colorado wine industry since one loyal Core customer will lead to a disproportionate increase in sales, although Core drinkers may also be the most difficult to impress and gain as customers.

In short, all secondary data on Colorado's wine market suggest high potential not only in terms of total consumption but also in growth of sales and propensity to consume wine produced domestically (although further research must establish whether Colorado wines compete with other domestic varietals).

GRAPE AND WINE PRODUCTION IN COLORADO

The size and dynamic of Colorado's wine industry has not been extensively studied prior to this study, which collected a large amount of direct industry data.[11] Dr. Horst Caspari, State Viticulturist at the Western Colorado Research Center estimates that there are 130 winegrape growers in Colorado, all of whom attempt to be in production every year, and they devote close to 650 acres to winegrape production. In 2004, the three primary varieties grown in Colorado were Merlot (21% of the acres), Cabernet Sauvignon (18%), and Chardonnay (16%).

TABLE II
Colorado's CDI of Major Wine Categories
Source: Adams Wine Handbook, 2005

Wine Category	CDI
Table Wine	124
Wine Coolers	200
Champagne/Sparkling	87
Dessert/Fortified	51
Vermouth/Aperitif	52

TABLE III
Alcohol Consumption Patterns of U.S. Adults
Source: 2005 Study Sponsored by Wine Market Council

Category	% Of U.S. Adults
"Core" Wine Drinkers	13.7
Marginal Wine Drinkers	18.9
Beer/Spirits Only	24.7
Non-Drinkers	42.7
TOTAL	100

[11] Most of the data contained in the remaining sections of this report were obtained from these sources: (1) survey of winegrape growers by Dr. Horst Caspari; (2) mail surveys conducted among Colorado winegrape growers and wineries; and (3) personal interviews among visitors to the Grand Junction Winefest and selected wineries during Fall 2005.

The typical active Colorado vineyard has 6.2 acres, with an average yield of 2.5 tons of grapes per acre. In 2004 they produced about 1,230 tons of grapes, but not all of these grapes were sold since they became inputs to the growers' own wine production. Of those sold, the average price received for a ton of grapes was around $1,300, with an estimated total crop value of $1.6 million (assuming those sold were of similar value to those retained for wine production).

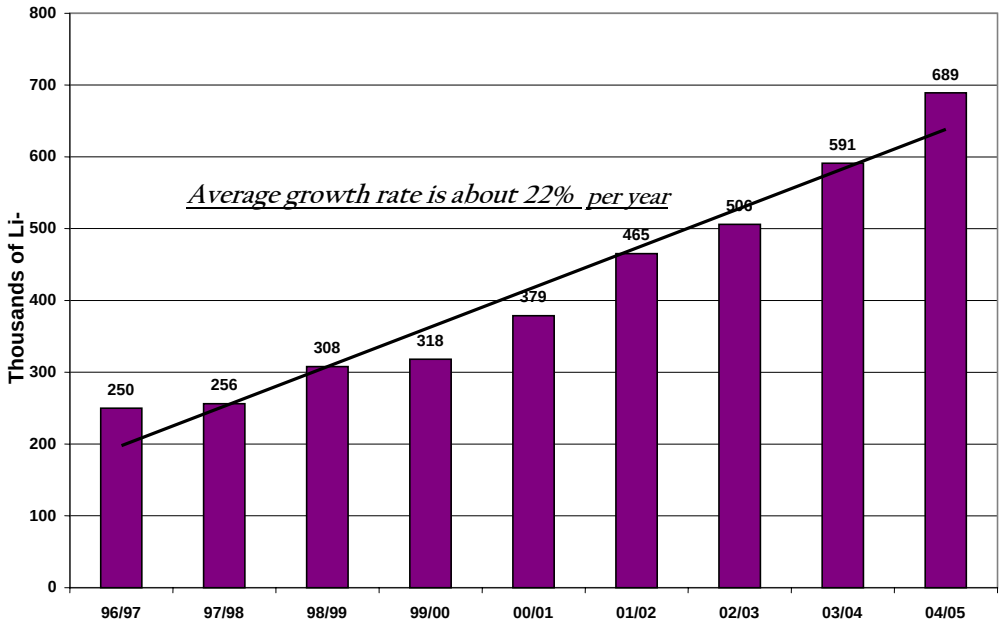
It is estimated that total U.S. wine production in 2004 was around 640 million gallons. As of March 2006, there are 66 wineries operating in Colorado. In the US, there are currently more than 3,700 wineries, with 1,689 (45%) located in California (Table IV).

The amount of wine produced in Colorado over the last decade has been increasing at a fairly rapid rate as more vineyards and wineries enter the business. In fiscal year 1994/95, around 113,600 liters of Colorado wine were produced. By the 2004/05 season that number had increased five-fold to almost 689,000 liters.

TABLE IV
Number of Wineries in the U.S. and Colorado
Source: Alcohol and Tobacco Tax and Trade Bureau

Year	US Wineries	US Growth Rate	Colorado Wineries	CO Growth Rate
1975	579		2	
1985	1367	136%	3	50%
1995	1817	33%	13	333%
2000	2188	20%	30	131%
2005	3726	70%	66	120%

Over the last five years the production and sale of Colorado wine has doubled (Figure 4).



Source: Colorado Wine Industry Development Board

Figure 4 – Colorado Wine Production, 1996-2005

In fiscal year 2004/05, Colorado wineries produced approximately 76,550 cases (1 case contains twelve 750 ml bottles). This was approximately 1.5% of all the wine sold in Colorado by volume. If the average retail value reported by Colorado wineries, $12.86 per bottle, is assumed (Colorado wine tends to be higher priced than the U.S. average of $6.14 per 750 ml), the retail value of Colorado wine was around $11.8 million or a little over 3% of total market share by value.

It is important to recognize that wineries also attract many tourists/visitors, the focus of another section of this report focused on associated economic activity. Numerous wine tasting events and wine festivals occur around the state, drawing visitors to these communities for purposes of tasting wine. Table V lists the total attendance at many of the festivals around the state.

RESULTS OF ECONOMIC CONTRIBUTION ANALYSIS

The data used for this analysis were collected through a process that integrated an understanding of all the different elements that contribute to an industry's contribution to the economy (direct sales, money spent by those who inputs and labor are purchased from, allied activities, and of particular interest to this study, the tourism that may be driven by the existence of the wine industry.

The direct revenue from wine sales attributed to Colorado's wine production industry totaled an estimated $11 million in 2004 (Table VI) while total industry expenditures were estimated at $7.85 million dollars (Figure 5). The distribution of these expenses is important to the economic analysis, because they affect how the wine industry generates activity for other businesses that support it in the state. Intermediate inputs, or the expenditures of an industry on goods that get used up in the production of their product, accounted for 48% of the total $11 million in industry revenue. The remaining 52% was accounted for as wages paid, taxes, returns on capital and proprietor's income. The wine industry was estimated to have directly generated 70 jobs in Colorado's economy, paid out $1.4 million in employee compensation (including salaries and benefits), and contributed over $400,000 in sales tax revenue to the state.

Grapes are not as large of a share of the wine value as some might expect, although one might argue that the presence of the vineyards adds appeal to potential visitors to Wine County. Still, the value of Colorado's grape production totaled $1.5 million in 2004 and total grape acreage was estimated at 650 acres. This puts the value of grape production at $3,072 per acre. By comparison, an optimistic yield for irrigated corn in Eastern Colorado is 200 bushels per acre and at $2 a bushel this would generate $400 dollars an acre. When the value added step of producing wine is added, the wine in Colorado generated direct revenues of over $14,000 per acre. Additionally, the multipliers are much smaller for capital-intensive field crops. For example, the multiplier associated with grain farming is 12% lower than for wineries meaning that an equal direct impact on the wine industry in Colorado will have a 12% higher impact on the state's economy relative to the grain industry.

TABLE V
Attendance at Various Wine Festivals Across Colorado
Source: Event Organizers

Event	Attendance
Colorado Mountain Wine Festival	5,200
Denver International Wine Festival	800
Fort Collins Wine Festival	900
Lafayette Wine Festival	2,200
Manitou Springs Wine Festival	800
Mesa Verde Wine Festival	500
Stapleton Wine Festival	300
Steamboat Springs Wine Festival	2,000
Telluride Wine Festival	3,000

TABLE VI
Colorado Wine Industry Output, Employment,
and Value Added
(in $millions)

	Industry Output	Employment	Employee Compensation	Proprietor Income	Other Property Income	Sales Taxes	Total Value Added
Wineries	$10.998	70 workers	$1.45	$3.15	$0.79	$0.40	$1.63

Source: IMPLAN estimates derived through data collected from 2005 Colorado State winery survey

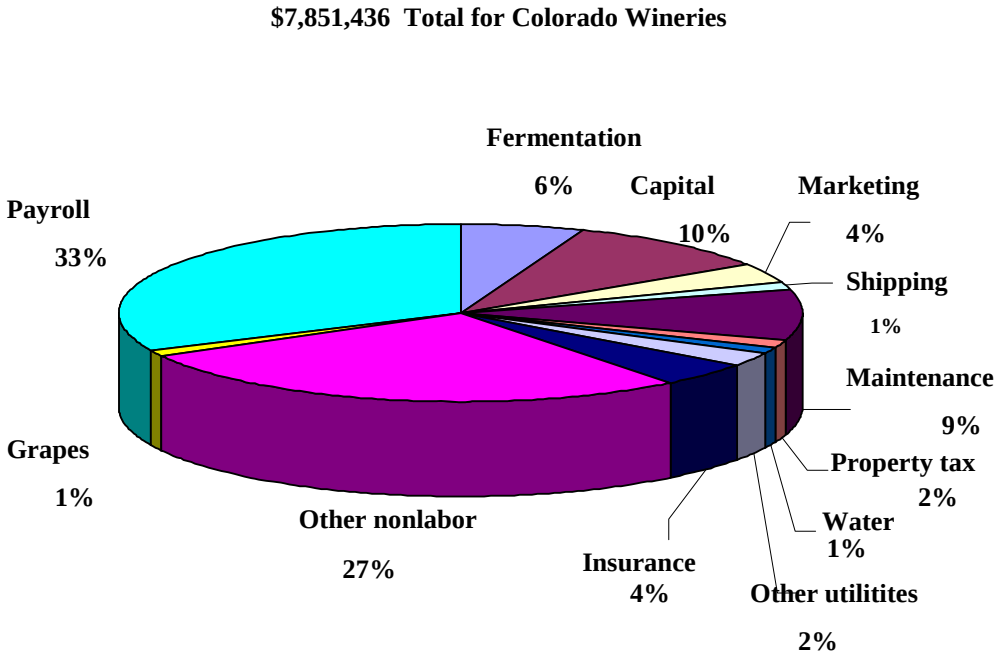


Figure 5 – Winery Expenditures

Source: Colorado State University 2005 Winery Survey

Indirect Contributions

When a business expands or contracts, there is a ripple effect through the economy. For example, when a grower or winery expands, they buy more fertilizer or bottles and they hire more workers. This new economic activity generates even more activity in related businesses who sell to the operation, and who, in turn, buy more inputs and hire more labor. The total impact of a change by one industry therefore is multiplied through the economy through various linkages to other businesses and payments to workers. To capture this effect, it is necessary to use an economic model that contains these linkages, but it is virtually impossible to fully determine linkages through an entire economy by means of surveys. Still, this study goes further than most economic analyses in directly collecting a large share of primary data to integrate into the economic model.

It was estimated that total sales of wine in the state of Colorado were just over $382 million and an additional $31 million of wine was purchased as an intermediate input into other goods such as an ingredient in foods. This puts total wine demand in the state at $417 million. With Colorado producers generating $11.8 million in wine sales in 2004, it is assumed that the state's wine industry is only capable of supplying around 3% of the state's demand.

In addition to the direct revenues generated by wineries, the wine industry leads to indirect revenues in other industries such as grape growers, graphic artists, and bottle makers. For example, when the wine industry expands they demand more grapes, more labels, and more bottles. This increased demand has an effect on the suppliers of these intermediate goods. This is called an indirect effect of an industry. Likewise, the income that the wine industry generates both in the wine production industry and in the indirectly enabled industries is spent in the economy, which then creates an induced effect. Together the direct, indirect and induced effects are used to calculate the industry's multiplier. All of these effects together constitute the total economic contribution of an industry. The multiplier calculated for the wine industry was 1.922 (Table VII). So, the industry is estimated to generate about $21.1 million dollars in economic activity in the state's economy, but this still doesn't account for affiliated activities such as tourism.

On top of wine production, Colorado's wine industry also generates economic activity by attracting tourists who visit the wineries and attend events and festivals. Based on data obtained from surveys of Colorado wineries, it is estimated that in 2005 over 120,000 people visited the state's wineries, and another 37,000 participated in various education and wine tasting programs. (The average winery had 2,250 visitors and 698 participants in various wine related programs during the past year.) Reported expenditures by visitors suggest that these places generate an additional $11.8 million in direct spending, using very conservative assumptions about what tourism can actually be attributed to the wine industry. After this number is put through the customized regional input-output model it was determined that tourist expenditures contribute an additional $20.6 million of economic activity to the Colorado economy. In total, the wine industry in Colorado is expected to contribute $41.7 million in economic activity to the state.

WHAT IS THE ECONOMIC IMPACT?

The results presented here have all been in terms of the economic contribution of the wine industry, which includes all the sales associated with wine and how that money cycles through the economy. It was found that the total economic contribution of the wine industry was $41.7 million dollars. The true economic impact of an industry is generally much smaller than its contribution, because an impact accounts only for the marginal gain in economic activity that the industry adds to the economy over what would likely be present if the industry were not present. It is often also presented as the marginal gain or loss to economic activity in the region due to an expansion or contraction of the respective industry.

In the case of the wine industry, wine purchased by locals and visitors are both impactful. If there were no wine production in Colorado, people would likely substitute wines from other regions. Thus, Colorado's wine industry represents import substitution, and the entirety of the industry's output can be considered an economic impact to the state's economy.

CONCLUSIONS

This study on the economic contributions of the wine industry to Colorado is of interest for several reasons. In addition to the numbers showing the size of this industry, it also focuses on the importance of tourism to this sector, and the potential role the wine industry may play in driving tourism in the region. Given the continued growth in wine consumption in the US, higher prevalence of consumption among a growing Colorado population and increasing number of wineries in the state, this contribution will continue to grow, and possibly, drive other food-related industries as Coloradans explore local based food and drink offerings.

The authors….
This report is part of an industry and CSU-funded research project undertaken in Fall of 2005 to identify the impact the Colorado Wine Industry has on the economy of Colorado. The project was funded by the Colorado Wine Industry Development Board and the Grand Junction Visitor and Convention Bureau. Project leaders were Dr. George Kress, representing the CSU College of Business, and Dr. Dawn Thilmany from CSU's Department of Agricultural and Resource Economics. Most of the data analysis on economic contributions using IMPLAN was performed by Phil Watson, PhD Candidate in the Department of Agricultural and Resource Economics.