Evaluating Market Size

Russell Tronstad, Ph.D.
Professor and Extension Specialist, Department of Agricultural and Resource Economics
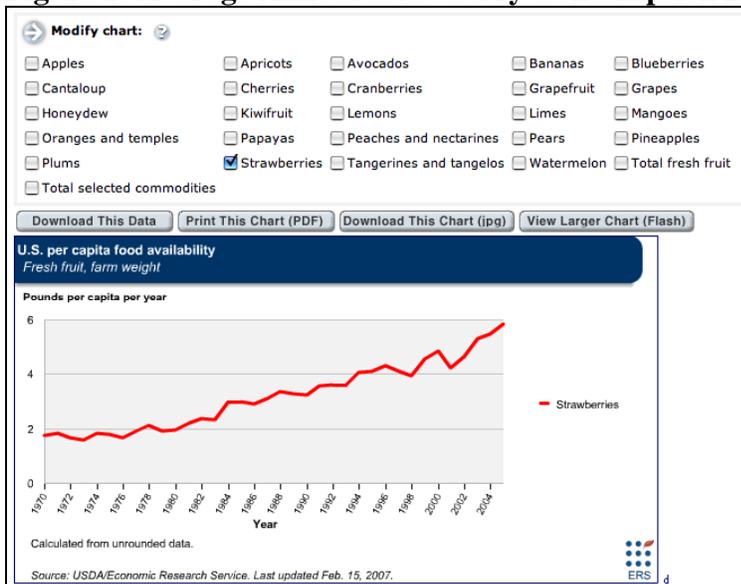**University of Arizona**

Overview

One of the most important tasks in evaluating the economic viability of a niche market is determining the size of the market. If the market is too small, there will not be enough sales available to cover startup, capital, and operating costs. Conversely, if the market potential looks quite large, it is not a niche market and direct competition in the form of commodity markets will likely prevail, unless a competitive edge that others cannot replicate can be created. To determine the market size of a niche product, information regarding typical consumption patterns and consumer demographics proves very useful.

Consumption Considerations

Average annual U.S. consumption levels of several hundred foods are readily available from the United States Department of Agriculture's Economic Research Service (USDA-ERS) for years back to the early 1900s for some foods (see the "More Information" section at the end of this fact sheet for the Web address for this service). Users can download data in spreadsheets or make custom queries for specific food groups, commodities, and/or years. For example, Figure 1 shows how a query of "fresh fruit by farm weight" for strawberries can provide a graphical display of the annual average consumption of fresh strawberries, in pounds, consumed per person in the U.S. from 1970 to 2006 (the years for which data is available varies by product). This information can be used to help producers determine whether the market size is right for the niche product or operation under consideration.

Figure 1: Average Annual Strawberry Consumption Data from USDA-ERS

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Consider the example of a producer contemplating turning a portion of an existing strawberry operation into a U-pick strawberry patch on a three-acre field, with expected production around 10,000 pounds per acre. To calculate market size for this example, the producer must figure out what volume of strawberries would be necessary to supply all potential customers with one week's supply at average fresh consumption levels. To do this, multiply the acres of strawberries to be grown by the predicted growth per acre, and divide this by weekly fresh consumption per capita (which is the annual fresh consumption divided by 52, the number of weeks in a year). Equation 1 shows how to do this:

$$(1) \quad \frac{\text{(Acres in operation)*(Output per acre)}}{\text{(Average consumption per person/year)/(52 weeks/year)}} = \text{Market size required}$$

Using the numbers for this example, the proposed U-pick operation would require a market size of 260,000 consumers (3 acres * 10,000 lbs per acre /(6 lbs per year / 52 weeks per year)). When performing this calculation, it is important to consider that the product may be sold at a discount relative to supermarket price levels, and therefore it might be expected that consumers will buy more than their average consumption levels (because selling at a discount allows consumers to purchase more of the product for the same amount of money). Table 1 shows the data used and market size required for both strawberries and beef, as well as the price elasticities (discussed below) for each. To calculate the market size required for the beef operation in Table 1, the total pounds of beef that is expected to be produced can be used for the numerator in Equation 1, rather than acres in use and expected output per acre. The market size of 41,677 consumers per week shows that in this case, the market required for such an operation is significantly smaller than that required for the strawberry operation. It should also be noted that if the beef was sold to consumers with enough freezer space to purchase beef for an entire year, the market size needed would drop to 801 consumers (41,677 consumers/52 weeks per year). However, it is still imperative that producers consider whether or not enough consumers can be found to meet the market size requirement. It is also important to note that these numbers are for standard, conventional strawberry and beef products; the market for a differentiated product will likely be different.

Table 1: Market Size Data and Price Elasticities for Strawberries and Beef

	Strawberries	Beef
Average annual per capita consumption	6 lbs/year	62.4 lbs/year
Acres available	3 acres	---
Expected production	10,000 lbs/acre	50,000 lbs
Required market size	260,000 consumers	41,667 consumers
Price elasticity	-0.928	-.0612

To obtain insights into the elasticity of supply response for different food products, USDA-ERS provides a website where elasticity estimates taken from academic, business, and industry literature can be obtained through customized pull-down menus (see the "More Information" section for the Web address). Figure 2 shows an example of finding elasticity estimates for U.S. strawberries. The average own-price elasticity estimate of strawberries in the literature is -.928. This elasticity estimate suggests that U.S. consumers may not be very responsive to bargain

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strawberry prices because each 1% drop in price would increase purchases by 0.9%, or less than 1%. For example, if consumers purchase 10 pounds of strawberries for $1 per pound, decreasing the price to $0.99 per pound (a discount of 1%) would result in purchases of 10.09 pounds, an increase of less than 1% of a pound. While the sales volume would increase, the revenue obtained from the discounted price would be only $9.99, compared to the full $10 in revenue that would be collected with the initial price of $1 per pound. Other attractions, activities, and information may be needed to persuade consumers to purchase more strawberries at the U-pick operation in this example. Table 1 shows that demand for beef is even more inelastic than strawberries, with an own-price elasticity of -.0612. For more information on price elasticities and inelastic demand, please see fact sheet WEMC FS#4-08, "Niche Market Pricing and Strategies for Maintaining Price Premiums" in this publication.

Figure 2: Online Price Elasticity Estimates from USDA-ERS

A primary goal of niche marketing is to make the demand for the product more inelastic (less sensitive/responsive to price, meaning consumers will purchase the same amount of the product even if there is premium pricing or a price increase). Differentiating agricultural products means that the product needs attributes that are not available in the supermarkets or from other competitors. These attributes may involve freshness, how the product was grown or raised, a farm experience, superior service, or other "special" attributes. If the desire is to grow products organically or under a different certification program, the number of consumers willing to pay a premium for this will also need to be adjusted. Although organic consumption continues to increase, organics still account for a very small percentage of consumed foods.

Demographic Factors

Consumer demographics are a crucial component in determining market size. If planning to sell items directly from the farm or ranch, consider how large a radius, in terms of travel distance, the operation can expect to draw customers from. The USDA Forest Service's National

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Survey on Recreation and the Environment found the average distance U.S. individuals drove to visit a farm in 2000 was 80 miles (USDA Forest Service, 2003). Because this also included family members visiting their relatives on farms several hundred miles away, most paying consumers will be drawn within a 50-mile radius unless no other farm visiting alternatives are available to them. However, some areas in the West find the majority of their consumers travel over 75 miles to participate in U-picks, farm festivals, and related farm activities, because no closer alternatives exist in their metro area (Leones et al., 1994).

Figure 3: Demographic Characteristic Estimates from U.S. Census

FACT SHEET

United States | 86505
Zip Code Tabulation Area 86505
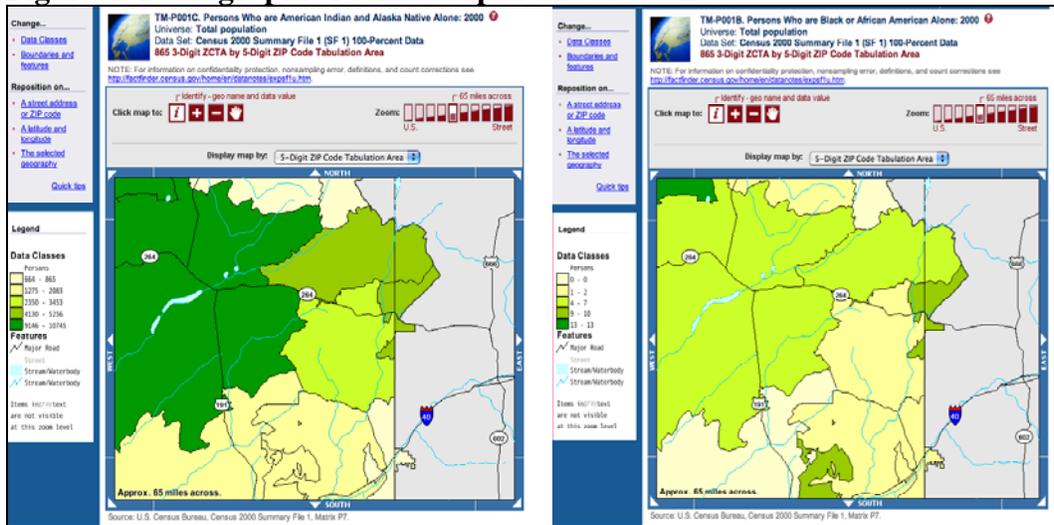
city/ town, county, or zip
86505
state
Arizona GO
search by address »

Census 2000 Demographic Profile Highlights: Reference Map

General Characteristics - show more >>	Number	Percent	U.S.		
Total population	9,508			map	brief
Male	4,728	49.7	49.1%	map	brief
Female	4,780	50.3	50.9%	map	brief
Median age (years)	25.8	(X)	35.3	map	brief
Under 5 years	871	9.2	6.8%	map	
18 years and over	5,731	60.3	74.3%		
65 years and over	794	8.4	12.4%	map	brief
One race	9,471	99.6	97.6%		
White	284	3.0	75.1%	map	brief
Black or African American	4	0.0	12.3%	map	brief
American Indian and Alaska Native	9,146	96.2	0.9%	map	brief
Asian	4	0.0	3.6%	map	brief
Native Hawaiian and Other Pacific Islander	1	0.0	0.1%	map	brief
Some other race	32	0.3	5.5%	map	
Two or more races	37	0.4	2.4%	map	brief
Hispanic or Latino (of any race)	99	1.0	12.5%	map	brief
Household population	9,343	98.3	97.2%	map	brief
Group quarters population	165	1.7	2.8%	map	
Average household size	3.60	(X)	2.59	map	brief
Average family size	4.30	(X)	3.14	map	
Total housing units	4,162			map	
Occupied housing units	2,598	62.4	91.0%		brief
Owner-occupied housing units	1,991	76.6	66.2%	map	
Renter-occupied housing units	607	23.4	33.8%	map	brief
Vacant housing units	1,564	37.6	9.0%	map	

Knowing the demographic characteristics of the consumers a potential niche market operation would like to target is a key aspect in assessing the market. In the U-pick strawberry example, the producer may be interested in targeting families as consumers. In this case, it would be helpful to know if the farm area has enough families to make up a generous portion of the 260,000 consumers necessary for the financial feasibility of the U-pick operation. Demographics from the most recent U.S. Census can be searched online by state and by zip code. The information from a Census search provides an indication of the ages of people in the area, household and family size, income, ethnicity, and more, all of which can provide producers with additional information as to the characteristics of potential customers in the local and surrounding area.

Figures 3 and 4 illustrate Census data for specific locations that is readily available through the Internet. Figure 3 shows an example using the "demographic profile" for zip code 86505 (Window Rock, Arizona). The total population is only 9,508, and 96.2% of the population is American Indian. Clicking on the "map" link for race in Figure 3 yields a set of population density maps delineated by race and zip code, as shown in Figure 4. Whether researching the market potential for an urban center or rural areas, these tools provide valuable baseline insights as to the market size and demographics of regional consumer bases.

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Figure 4: Demographic Profile Map from U.S. Census

Destination Consumers

For many rural areas, the local consumer base may not be large enough to support the minimum sales needed for the business plan to succeed. However, many rural areas in the West are located between a major urban center and a national or state park that serves as a vacation destination for numerous foreign and out-of-state visitors. Estimating the potential size of these markets requires information on where visitors are coming from prior to their visit, and going or returning to after their destination visit. For example, consider Grand Canyon National Park (GCNP), which attracts around 4.4 million visitors annually. As with many parks in the West, seasonal visitation is another important item to consider; Cothran et al. (2005) report that total annual visits to GCNP in 2004 varied greatly between season, with 11% of visits occurring in the winter, 27% of visits in the spring, 39% of visits in the summer, and 23% of visits in the fall. Table 2 on the following page shows where these visitors stayed prior to their trip to GCNP, as well as where they went after leaving the park. Consider a business located between Page, AZ and GCNP. The number of GCNP visitors that would pass by the business location each month would average 13,567. This figure was calculated as shown in Equation (2), by taking the total number of annual visitors, and multiplying it by the average percentage of visitors who visit Page before or after GCNP (found by taking the average of 3.4% and 4.0%), divided by 12 to obtain the monthly average, or 4.4 million * .037/ 12. Based on the percentages of seasonal visits from Cothran et al., visitors could range from a low of around 5,970 visitors during the winter months to a high of 21,164 during the summer.

$$(2) \quad \frac{(\text{Total annual visitors})*(\text{Average percentage of visitors})}{12} = \text{Average monthly visits}$$

Imagine an agritourism business plan that requires a minimum of $10,000 in sales each month to be viable, with expected average consumer expenditures of $25 per person. The business would need to attract 2.9% of GCNP visitors on average to make the business plan work (this is calculated below in Equation (3), using the numbers from the example, ($10,000/$25)/13,567); however, taking seasonality into consideration, the business would need

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to attract 6.7% of the winter and 1.9% of the summer GCNP visitors. Given the relatively high percentage of GCNP visitors needed to make this business plan work, trying to start on a smaller scale and/or maybe gearing up before the more heavily traveled summer months may help a venture like this succeed.

$$(3) \quad \frac{\text{Monthly sales needed}/\text{Expected sales per visitor}}{\text{Estimated monthly visitors}} = \text{Percentage of total visitors needed}$$

Table 2: Top Destinations Where Individuals Spend the Night Before and After Visiting Grand Canyon National Park

Destination	Before	After	Destination	Before	After
Flagstaff, AZ	17.5%	10.6%	St. George, UT	1.5%	1.4%
Williams, AZ	12.6%	7.3%	Scottsdale, AZ	1.4%	1.5%
Las Vegas, NV	9.4%	12.7%	Zion National Park, UT	1.4%	1.7%
Sedona, AZ	6.0%	6.7%	Jacob Lake, AZ	1.4%	<1%
Phoenix, AZ	5.3%	8.0%	Kingman, AZ	1.3%	2.1%
Tusayan, AZ	4.3%	2.4%	Tucson, AZ	1.2%	<1%
Page, AZ	3.4%	4.0%	Holbrook, AZ	1.1%	1.1%
Kanab, UT	1.9%	1.4%	Albuquerque, NM	1.0%	1.2%
Bryce Canyon National Park, UT	1.7%	2.1%	Cameron, AZ	1.0%	<1%

Agritourism

The USDA Forest Service's National Survey on Recreation and the Environment found that 62 million Americans over 16 years of age visited farms one or more times in 2000, which corresponds to almost 30% of the population (Barry and Hellerstein, 2004). These respondents said that the number one reason for their trip to the farm was to enjoy the rural scenery. Leones et al. (1994) also found that the primary reason for visiting farm outlets was the farm or rural experience, ahead of both freshness and quality of produce. As an industry, agritourism, or tourism related to farms and ranches, has been growing at a rate of around 6% annually in Europe and North America (Tchetchik et al., 2008). Tourism also tends to be relatively more important for rural and urban counties in the West compared to other regions of the U.S. For example, in Arizona tourism accounts for 7% to 17% of the employment in rural counties, but only 5.3% of total employment for the state as a whole (Rahman and Frisvold, 2006).

General tourism expenditures are useful for obtaining estimates on what people are willing to pay for their agritourism experience. Table 3 describes daily per person expenditures for visitors to Arizona in 2000, and 2002-2005 (Dean Runyan Associates, 2007; Arizona Office of Tourism, 2008). Each year, the amount spent on arts, entertainment, and recreation falls between $22 and $24 per person. If an operation offered food service and charged fees for various agritourism activities, a total of approximately $50 per visitor could be expected from this venture (when considering what consumers have paid for entertainment and food and beverage services). The Forest Service's National Survey on Recreation and the Environment also found farm visitors spend about $45 per person during each farm visit (USDA Forest Service, 2003). Foreign visitors generally spend more than domestic, but in setting prices one should always keep in mind that visitors having a good experience and receiving good value for each dollar they spend will likely become repeat business and share their experience with other potential farm visitors.

Table 3: Average Daily Spending for Arizona Visitors, Per Person (Domestic and Foreign, in 2006 Dollars)

Item	2000	2002	2003	2004	2005
Lodging	$23.8	$20.7	$20.6	$22.0	$22.0
Food & Beverage Services	$31.8	$32.0	$32.0	$33.2	$34.5
Arts, Entertainment, & Recreation	$22.4	$22.7	$22.9	$23.8	$23.7
Ground Transportation & Motor Fuel	$19.6	$17.7	$19.6	$21.9	$24.9
Retail Sales	$30.6	$30.1	$28.3	$28.1	$27.8
Total	**$128**	**$123**	**$123**	**$129**	**$133**

Concluding Comments and Summary

Evaluating the market size of a niche agricultural product and/or farm experience is fundamental to the financial success and growth of the business. Starting relatively small with new products and variations on existing products is generally a good way to test the waters and verify consumer response and feedback. Finding products and activities that compliment each other is often key to identifying a successful market niche. For example, home cooked "apple burgers" are not likely to be a successful draw by themselves, but combined with a U-pick experience and festival atmosphere filled with fun family activities, it may very well provide an edge over alternatives such as the zoo, a national monument, or a museum. It is also important to determine whether the market base will be primarily made of local or destination consumers. If individuals are looking to travel from one destination to a metro center, activities will need to cater to shorter time periods unless overnight lodging facilities are nearby.

The trade-off between a market that is too small and a market that is too large is fundamental to niche marketing. A consumer base that is too small will be unable to generate sufficient sales to cover time and capital investments, and will not be economically viable. However, a very large market potential is likely to meet stiff competition from other competitors, unless the product is differentiated or truly targeted at a niche market segment.

More Information

USDA's Economic Research Service (USDA-ERS) is a primary source of economic information for the USDA, conducting research in the areas of food economics, information services, market and trade economics, and resource and rural economics. ERS and the majority of its services can be found online at http://www.ers.usda.gov/. Data on average annual consumption levels for hundreds of foods in the United States can be found online at http://www.ers.usda.gov/Data/FoodConsumption/, which allows users to create tables and graphs to display the information. Price elasticities for hundreds of food products in the U.S. have been compiled from published literature and can be accessed from ERS at http://www.ers.usda.gov/Data/Elasticities/.

The U.S. Census Bureau provides data related to population estimates, demographic factors, income, economic indicators, and more, and can be found online at http://www.census.gov/. To find a demographic fact sheet on a specific zip code (as in Figure 3) or a given state, the American Fact Finder can be accessed online at http://factfinder.census.gov/home/saff/main.html. Maps such as those in Figure 4 can be created by an additional service at the American Fact Finder. From the previous Web address, click the button for "Maps" and select "Thematic Maps." This will present a menu of options for presenting statistical information in geographic regions.

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