

# Spring Mix Case Studies in the Sacramento Area

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## Introduction

The following case studies describe three supply chains for spring mix in the Sacramento Metropolitan Statistical Area (also called the Sacramento area):<sup>2</sup> an upscale regional supermarket chain (mainstream supply chain); a local producer selling at a farmers market (direct market supply chain); and a natural foods grocery cooperative selling locally grown spring mix (intermediated supply chain). For this study, “local” refers to spring mix grown, processed (if necessary) and shipped by firms within the Sacramento area; this definition distinguishes it from spring mix grown in the Salinas Valley, which is approximately 175 miles (a three hour drive) from downtown Sacramento. Most of the local spring mix is grown in western Yolo County, primarily in the Capay Valley.

## The Location: Sacramento Area

The Sacramento area is comprised of four counties (Sacramento, Placer, El Dorado and Yolo) located in the northern Central Valley (see figure 1). It is the 26<sup>th</sup> largest metropolitan area in the United States, with a population of 2,109,832 in 2008<sup>3</sup>. Most of the Sacramento area is part of the Sacramento Valley, which is the northern portion of the long and flat Central Valley—the home to much of California’s most productive agriculture.

While Sacramento is well-known as a center for government services within California, the Sacramento area has a diverse base of employers and industries. The city of Sacramento is at the hub of a major highway corridor; Interstate 5 runs north-south through it while Highway 80 stretches east to west. Many

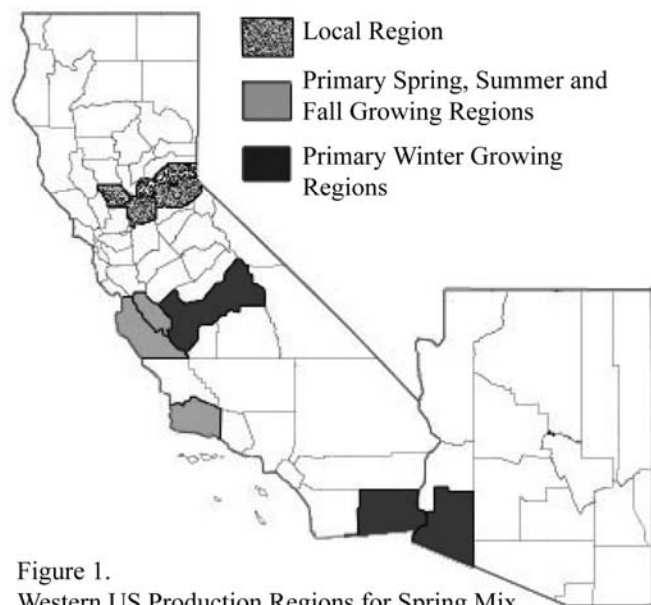


Figure 1. Western US Production Regions for Spring Mix

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<sup>2</sup> Additional case studies for apples in Syracuse, NY; blueberries in Portland, OR; beef in Minneapolis/St. Paul, MN; and milk in Washington, DC are available at [http://foodindustrycenter.umn.edu/Local\\_Food\\_Case\\_Studies.html](http://foodindustrycenter.umn.edu/Local_Food_Case_Studies.html).

<sup>3</sup> Statistical Abstract of the US, <http://www.census.gov/compendia/statab/cats/population.html>, accessed 1.4.10.

food companies maintain distribution warehouses in the area. Farmer's Rice Cooperative, Campbell's Soup, Blue Diamond, Crystal Creamery and Pacific Coast Producers are the area's major food processors.

Raley's, the nation's 38<sup>th</sup> largest grocery chain, is headquartered in the region. Seven other top 75 North American food retailers market in the Sacramento area, including another regional supermarket company, Savemart, and national companies Wal-Mart, Costco, Safeway, Whole Foods and Trader Joe's.<sup>4</sup> Specialty grocers include Nugget Markets, three natural foods cooperatives and numerous small ethnic markets.

According to the USDA's 2007 Census of Agriculture<sup>5</sup>, agricultural production within the four-county region totaled \$795 million on 5,152 farms, of which 4,726 (91.7%) were classified as "small" (with annual revenues under \$250,000) by the USDA. Major food commodities produced in the Sacramento area are processing tomatoes, wine grapes, rice, milk, almonds, apples and pears.

Interest in locally-grown food is strong in the Sacramento area. There are Slow Food chapters in Yolo, Sacramento and Placer counties and at Lake Tahoe. Regional agricultural promotion programs include Capay Valley Grown, Apple Hill Growers Association and Placer Grown. The four counties have 36 farmers markets<sup>6</sup> (several of which operate year-round) and about 30 Community Supported Agriculture (CSA) programs.<sup>7</sup> In 2007, fourteen percent of the farms in the Sacramento area were involved with direct marketing, compared to six percent nationally. The region's direct marketers averaged \$19,518 in revenues from this channel, but they ranged widely by county, from a low of \$6,924 in Placer County to a high of \$66,568 in Yolo County.<sup>8</sup>

## The Product: Spring Mix

Spring mix was chosen as the product focus for the supply chain case studies for the Sacramento area, rather than the general category of leafy greens. It originated in France's Provence region where it was referred to as mesclun. Alice Waters, founder of the Berkeley restaurant, Chez Panisse, is often credited with introducing spring mix on the West Coast.

There is no standard of identity for spring mix. A leading marketer, Earthbound Farms, lists the following organic greens as ingredients for its spring mix with the caveat that the ingredients in each package may vary: baby lettuces (red and green romaine, red and green oak leaf, lollo rosa, tango), red and green chard, mizuna, arugula, frisée, and radicchio. The proposed National Leafy Greens Marketing Agreement indicates that spring mix consists of "baby leaf items including, but not limited to, cress, dandelion, endigia, mache, mizuna, tat soi, winter purslane".<sup>9</sup>

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<sup>4</sup> Supermarket News, Top 75 for 2009, available at: <http://supermarketnews.com/profiles/top75/2009-top-75/index2.html>, accessed 12/30/2009.

<sup>5</sup> USDA-NASS. 2007 Census of Agriculture.

[http://www.agcensus.usda.gov/Publications/2007/Full\\_Report/Volume\\_1,\\_Chapter\\_2\\_County\\_Level/index.asp](http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_2_County_Level/index.asp), accessed 01/04/2010.

<sup>6</sup>USDA-AMS, <http://apps.ams.usda.gov/FarmersMarkets/> (Accessed 12.30.09).

<sup>7</sup> Local Harvest, available at <http://www.LocalHarvest.org> (Accessed 12.30.09).

<sup>8</sup> [http://www.agcensus.usda.gov/Publications/2007/Full\\_Report/Volume\\_1,\\_Chapter\\_2\\_County\\_Level/California/st06\\_2\\_002\\_002.pdf](http://www.agcensus.usda.gov/Publications/2007/Full_Report/Volume_1,_Chapter_2_County_Level/California/st06_2_002_002.pdf)

<sup>9</sup> National Leafy Greens Marketing Agreement, available at <http://www.nlgma.org/faqs.php> (Accessed 3.30.10).

## Spring Mix Production

Spring mix is grown primarily in California, Arizona and Florida. The largest production region for spring mix is California's Salinas Valley (Monterey and San Benito counties). Spring mix production regions in the Western United States are identified in figure 1, along with the Sacramento area. Spring mix is planted from January through October in the Salinas Valley and the Santa Maria area, and harvested from February through November. In Fresno County, Imperial County and Arizona's Yuma County, spring mix is planted from October through February, and harvested from November through March.

Spring mix production data for 2008 in the major California counties are shown in table 1. No spring mix production data are reported for any other locations in the United States. Monterey County in California's Salinas Valley is the largest producer of spring mix in the nation (and probably the world); in 2008, the county produced 242 million pounds of spring mix on 12,900 acres with a farmgate value of \$172 million. Due to double cropping, yield per acre in Monterey County averaged 18,800 pounds in 2008, compared to 7,000 pounds in Imperial County. Although spring mix is considered a niche crop, grower revenues in 2008 exceeded those earned nationwide for more traditional vegetable crops, such as green peas and asparagus.

**Table 1. Estimated Spring Mix Production in Major California Counties, 2008**

County	Acres	Pounds	Farmgate Value (\$)
Monterey <sup>10</sup>	12,901	242,000,000	172,386,000
San Benito <sup>11</sup>	2,591	49,178,000	16,419,000
Imperial <sup>12</sup>	6,306	44,142,000	37,521,000
Total	21,798	335,320,000	226,326,000

## Spring Mix Processing

After being harvested, baby leafy greens are trucked to a nearby processing facility where they are washed, dried, mixed together, packaged and shipped within 48 hours in refrigerated trucks to customers.<sup>13</sup> Some grocery chains and foodservice operations buy the spring mix directly from processors while others purchase the product from distributors who bought it from processors or producer wholesalers. With proper handling, packaged spring mix has a 17-day shelf life.

While most of the spring mix grown in California is machine harvested, processed and packaged at large processing facilities in the Salinas Valley, small farmers throughout the state produce an unspecified amount of spring mix by hand-harvesting and mixing a variety of baby lettuces with little or no processing equipment, and marketing it in bulk form—often at farmers markets and/or through Community Supported Agriculture (CSA) programs.

## Spring Mix Consumption

No per capita consumption data are reported for spring mix. However, the combined production of spring mix in California's Monterey, San Benito and Imperial counties of 335.3 million pounds in 2008

<sup>10</sup> Monterey County Agricultural Commissioner. 2008 Crop Report.

<sup>11</sup> San Benito County Agricultural Commissioner. 2008 Crop Report.

<sup>12</sup> Imperial County Agricultural Commissioner. 2008 Crop Report.

<sup>13</sup> Processing activities are described in greater detail in the mainstream case.

converts to 1.1 pounds of annual per capita consumption for the United States. Comparison of production levels in 1998 and 2008 in two of the counties, Monterey and Imperial, indicates a 202 percent increase. It is highly likely that growth in consumption nationwide mirrors the tripling in production over the nine year period.

### Spring Mix Prices and Availability

Local and non-local spring mix availability was observed at six market locations in each of the five metropolitan study areas throughout 2009: Sacramento, CA; the DC Area; the Twin Cities, MN; Syracuse, NY; and Portland, OR. Market locations usually consist of two supermarkets, two natural foods stores, and two farmers markets. With the exception of farmers markets, spring mix is sold primarily in packages, packed usually in four- and five-ounce bags, and five-ounce and one-pound clamshells. Unlike virtually every other produce item in the US food system, the number of organic products available in a geographic market in this study is equal to or greater than that for conventionally-grown product. In most markets; conventionally-grown spring mix is available solely in five-ounce packages. Natural food stores market only organic spring mix.

Table 2 shows the availability of spring mix across market types and study locations. It was available consistently at supermarkets and natural foods stores in all locations except New York where the natural foods store did not carry any spring mix during two periods lasting at least 10 weeks. The availability of spring mix from local food supply chains is relatively limited; only farmers markets in Sacramento, District of Columbia and Portland, along with natural foods stores in the Twin Cities and Portland, carried the local product for extended periods. Overall, consumers in Portland appear to have the greatest access to local spring mix. Moreover, seasonality does not appear to preclude the supply of local spring in the Sacramento, DC and Portland areas.

Table 3 presents median prices for spring mix in each of the case study areas. Products are grouped by supply chain (local and non-local) and channel (supermarket, natural foods store, farmers market) and are differentiated by product attributes (conventional and certified organic). There is no spring mix available from local food supply chains in Syracuse. Availability of bulk spring is greatest in Sacramento. Prices for spring mix vary by product attributes across all markets and study locations; they tend to be the highest in the Twin Cities. Prices tend to decrease with package size. The median price of organic spring mix is not necessarily higher than that for the conventional product; this unexpected result is attributable to the larger number of conventional spring mix products in four- and five-ounce containers that are sold at a higher cost (per pound).

## Mainstream Case: Nugget Markets

Nugget Markets Inc. (Nugget) is a regional chain owned by the Stille family who founded the firm in 1926. It operates nine upscale Nugget supermarkets and three Food4Less warehouse-type discount stores; ten of the stores are in the Sacramento area. Nugget's sales revenues totaled \$288 million in 2009. In the Sacramento-Stockton-Modesto grocery market, it is ranked number six with a 2.9 percent share; locally-owned Raley's is the market leader with a 23.4 percent market share, followed by Safeway with 19.6 percent and Savemart with 17.3 percent.



**Table 3. 2009 Annual Median Spring Mix Prices by Product Type, Location, and Channel<sup>1</sup>**

	Sacramento CA (\$/lb)	DC Area (\$/lb)	Twin Cities MN (\$/lb)	Syracuse NY (\$/lb)	Portland OR (\$/lb)
<i>Products from <b>Local</b> Food Supply Chains</i>					
Natural foods store: organic-packaged	-	-	\$19.60	-	\$7.79
Natural foods store: organic-bulk	\$5.99	-	\$8.49	-	-
Farmers markets: conventional-bulk	\$6.00	\$9.00	\$9.00	-	-
Farmers markets: organic-bulk	\$7.00	\$10.00	\$9.00	-	\$8.95
<i>Products from <b>Non-Local</b> Food Supply Chains</i>					
Supermarkets: conventional, packaged	\$10.53	\$11.17	\$11.17	\$10.53	\$9.54
Supermarkets: organic, packaged	\$12.77	\$12.77	\$7.99	\$12.29	\$8.00
Supermarkets: organic, bulk	\$6.49	-	-	-	-
Natural foods stores: organic, packaged	\$11.49	\$12.77	\$12.77	\$10.53	-
Natural foods stores: organic, bulk	\$5.99	\$6.99	\$5.99	-	-

<sup>1</sup> Price data were collected at five to six locations in each metro area throughout 2009. Prices reflect a mix of bulk and packaged products. Product-location mix not shown when particular product type, location, and channel is unavailable.

Nugget recently described its mission as "...a family of dedicated people with a love of food and a passion for excellent service."<sup>14</sup> In the late 1990s, Nugget overhauled its marketing strategy with a new "Fresh to Market" concept, and began using a European-style open-air store format featuring specialty departments and a large selection of both conventional and organic fruits and vegetables displayed attractively in its produce department. Locally grown produce is marked with colorful signage.

## Supply Chain Structure, Size, and Performance

Earthbound Farms (Earthbound)<sup>15</sup> is Nugget's primary spring mix brand; Nugget's spring mix supply chain is depicted in figure 2. This case focuses on production, processing, marketing and distribution for this supply chain.

### Production and Processing

Earthbound is located in the Salinas Valley, which is often called "America's salad bowl". Now an icon in the organic food industry, it was founded as a two-and a half-acre Carmel Valley garden plot in 1984 by Drew and Myra Goodman. In 1986, Earthbound became the first company in the nation to sell small bags of pre-washed mixed organic baby lettuces to retail customers, starting with natural foods stores in the Monterey Bay area as well as in San Francisco. In 1992, Earthbound purchased a 32-acre farm and built a 9,000 square-foot processing facility. Bagged mixed salad greens began growing in popularity nationwide; by 1993, Earthbound was selling one-pound bags of salad greens to Costco, Safeway and Albertsons. In 1999, the Goodmans became equal partners with produce giants Mission Ranches and Tanimura & Antle, and operated Earthbound as Natural Selection Foods. In July, 2009, HM Capital Partners LLC, a private equity firm focused on investments in the food, energy and media industries, acquired Natural Selection Foods and changed the firm's name to Earthbound Farm.<sup>16</sup>

All of Earthbound's produce is now certified organic. While Earthbound now describes itself on its website as the world's largest grower of organic produce, it actually sources its leafy greens and other produce from 150 farms growing on more than 35,000 acres.<sup>17</sup> It has become a diversified food company, marketing over 100 different varieties of organic salads, fruits, and vegetables, and a small assortment of dried fruits, snacks, beverages, cookies and granola.<sup>18</sup> Its broad product offerings reflect the company's mission: "to bring the benefits of organic food to as many people as possible and serve as a catalyst for positive change."

The front of Earthbound's spring mix packages includes the USDA organic logo and a label indicating that the product was "grown in the USA and Mexico and processed in the USA." Approximately 60 percent of Earthbound's spring mix is grown in the Salinas Valley, located about 175 miles from downtown Sacramento. During the late fall and winter, spring mix is produced in the "desert region", which consists of Imperial County in southeastern California, neighboring Yuma County in Arizona and northern Mexico.

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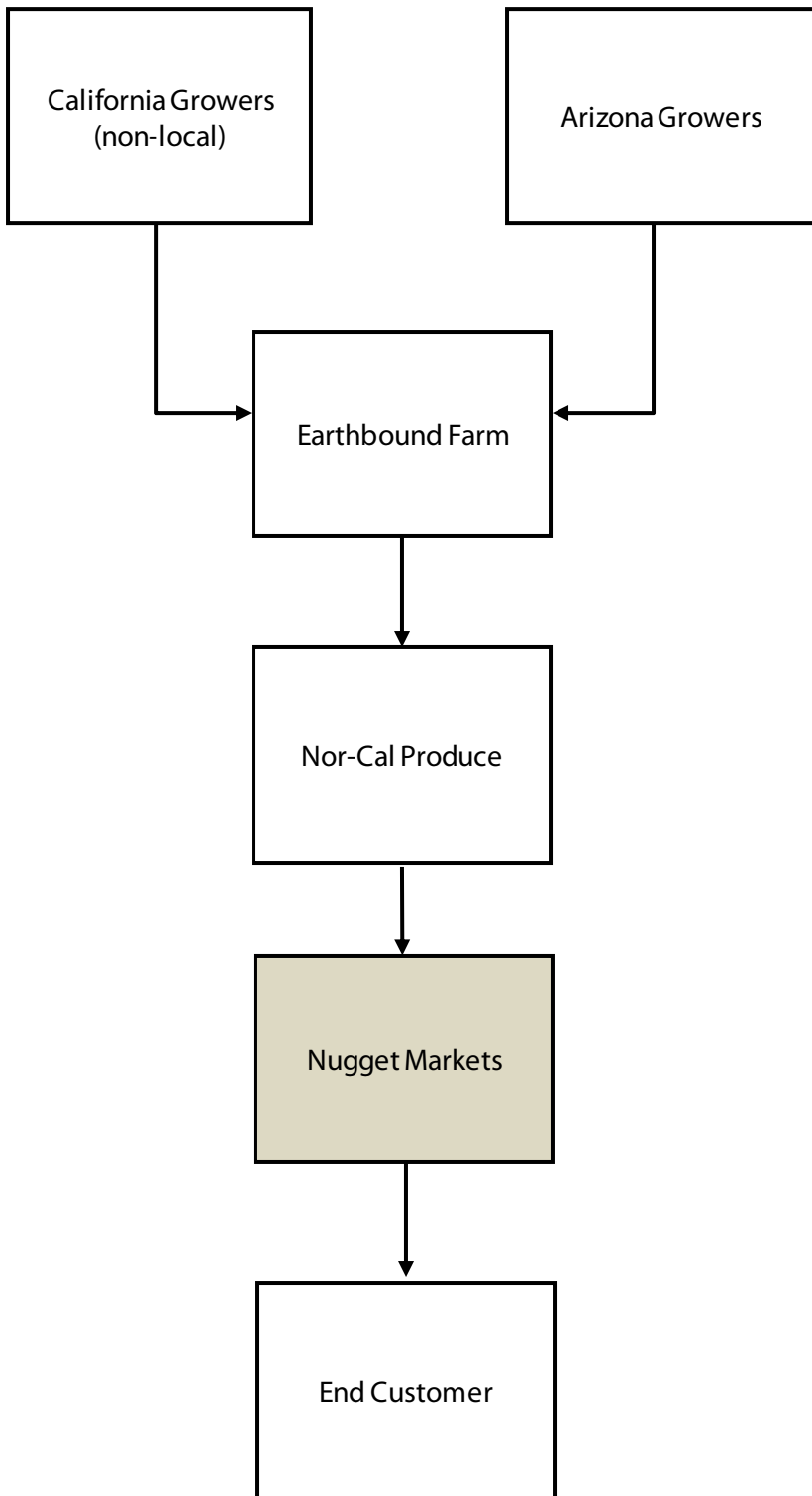
<sup>14</sup><http://www.facebook.com/nuggetmkts?v=info>, accessed 05/02/10.

<sup>15</sup> All information reported regarding Earthbound was obtained through secondary sources such as news articles and websites.

<sup>16</sup> This history is a summary of Earthbound's milestones posted at: <http://www.ebfarm.com/AboutUs/EarthboundFarm-2010MediaKit.pdf>, accessed 05/01/10.

<sup>17</sup> <http://www.ebfarm.com/Products/QualityFoodSafety.aspx>, accessed 05/01/10.

<sup>18</sup> <http://www.ebfarm.com/Products/index.aspx>, accessed 01/03/10.



**Figure 2. Mainstream Supply Chain, Nugget Markets**

Substantial coordination is required in the planting and harvesting of spring mix crops to ensure that the quantity and variety of the salad greens that are harvested match up with its expected demand. Food safety considerations and the diminishing supply of field labor caused more growers to utilize stainless steel harvesters. The delicate baby leafy greens are machine-harvested early in the morning when temperatures are the coolest. The cut greens move through the “Rube Goldberg”-type machine’s rollers and on to a two-stage sort belt which drops out undersized and partially cut leaves; a fine water mist is applied before the leaves fall into totes. According to Valley Fabrication, a major manufacturer of such harvesters, the machine can harvest about 6,000 pounds per hour using totes.<sup>19</sup> Another manufacturer of spring mix harvesters, Ramsay Highlander, claims that its machines are capable of harvesting over 15,000 pounds per hour, and that spring mix harvesting costs have been reduced from \$0.28 per pound to less than \$0.01 per pound.<sup>20</sup> The totes are packed on to pallets and loaded on to trailers. The harvested leafy greens are transported to a reefer next to Earthbound’s processing facility.

Assuming that 60 percent of the spring mix crop was grown in Monterey County and 40 percent in Imperial County, growers received farmgate prices averaging \$0.77/ lb in 2008.<sup>21</sup> Assuming that organic product earned a 10 percent premium and comprised 45 percent of each county’s reported production, the estimated average price paid to growers for organic spring mix is \$0.81/lb.

### Processing

Because Earthbound sources leafy greens from two growing regions, it operates two processing facilities, one in San Juan Bautista, California (at its headquarters) and a smaller one in Yuma, Arizona. It usually moves in mid-November from its processing facility in San Juan Bautista to its Yuma plant (about 585 miles) to process leafy greens grown in the desert region, and usually moves back to San Juan Bautista sometime during mid-March.

After being cooled, the leafy greens are delivered to Earthbound’s processing facility (see figure 3). As described on Earthbound’s website<sup>22</sup>, samples of the greens are taken from each load for testing for food-borne pathogens. The greens are inspected, washed in chlorinated water, and dried on Earthbound’s custom-designed equipment line. Samples of the packaged salads are removed for testing for food-borne pathogens. All packaged product is held until clear test results are obtained. Individual packages are packed in cases, which are then palletized. The pallets are moved to a large, refrigerated storage area next to the truck loading docks. Large chains pick up orders from Earthbound and deliver the loads to their produce distribution centers. Produce distributors also purchase from Earthbound, as do produce wholesalers located at terminal markets. Trucking takes three and a half to six days to the East Coast. When stored properly, the spring mix has an expected shelf life of 17 days.

### Distribution

As noted on its website (<http://www.nuggetmarket.com>), Nugget has “been working with Nor-Cal for more than two decades on a relentless search for the best produce grown locally and across the globe.” Nor-Cal is a (local) West Sacramento-based business that was founded in 1971 by Daniel and

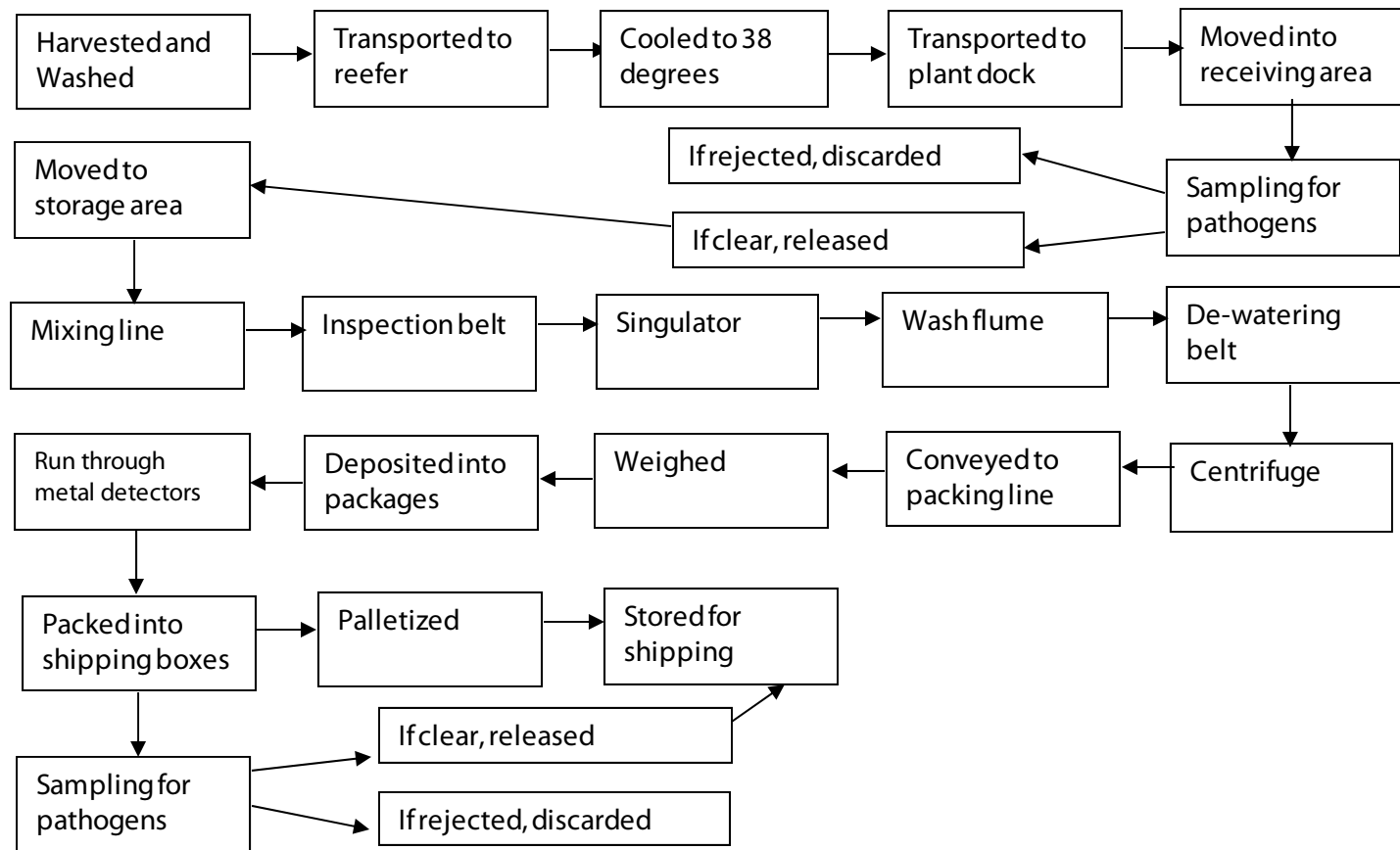
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<sup>19</sup> <http://www.valleyfabrication.com/babyleafcutter.html>, accessed 05/21/09.

<sup>20</sup> <http://www.ramsayhighlander.com/products/spinach-spring/spinach.htm>, accessed 11/18/09.

<sup>21</sup> Based on the Agricultural Commissioner’s Crop Reports for Monterey and Imperial counties, which report the combined revenues for organic and conventional spring mix.

<sup>22</sup> <http://www.ebfarm.com/Products/QualityFoodSafety.aspx>, accessed 12/15/09.



Adapted from "Natural Selection: Recall from E. coli Outbreak Recall of Fresh Spinach," by John Stelzer, Jeff Rush and Jean Kinsey. Food Industry Center, University of Minnesota, October, 2009.

**Figure 3. Earthbound Farm's Processing Flow**

Linda Achondo. Their sons, Dan and Todd, are now actively involved in Nor-Cal's management. The firm began as a vegetable distributor, added fruit in 1990, and added organic produce in 2000. In 1999, Nor-Cal expanded its geographic reach to include Brookings, Oregon to the north, Salinas in the south, Minden, Nevada to the east and San Francisco to the west. It built its current 85,000 square facility in 2002, which includes a 5,000 square foot office. In 2008, Nor-Cal grossed \$121 million. Nugget is Nor-Cal's largest revenue source.

Nor-Cal has three cold rooms. Naked lettuce is stored in a cold box (wet room) held at 34.5 degrees. Packaged salads are held in a different room at 34.5 degrees. Alarms go off in these rooms if the temperature varies by more than 1.5 degrees. Warehouse personnel use a ReachTruck to store product in the upper racks.

As a general practice, Nor-Cal uses a relatively small number of suppliers who know its quality expectations in order to minimize its quality control problems. Nor-Cal reviews its produce inventory daily. Its buyers get in between 4AM and 6:30AM and begin receiving orders from stores. They phone in most of their orders to their suppliers, including Earthbound, by 9AM. Nor-Cal's order entry staff enters each store's orders. The dispatcher contacts its Salinas-based trucking company. Trucks get load sheets and begin arriving at coolers in Salinas around 1PM; they often go to more than one supplier. The drivers check their load sheets to make sure that proper items are loaded onto truck; they do not do a quality check. Nor-Cal takes ownership of the product when this loading is done. The trucks from Salinas arrive at Nor-Cal by 11PM. During the desert season, the trucking company moves part of its trucking fleet to El Centro; the trucks begin picking up by 1PM from various Nor-Cal vendors, including Earthbound's Yuma plant and arrive at NPC the next afternoon.

Since temperature control is key for many produce items, Nor-Cal's receiving personnel feel the temperature of truck trailer when it arrives; if it feels too warm, they check the current temperature inside the reefer unit and inside a box of produce. The pallets are unloaded into the warehouse using a pallet jack and forklift; boxes are spot-checked for quality.

Around 11PM the same evening, warehouse forklift operators begin loading Nor-Cal trucks using pick lists based on order entry sheets. Nor-Cal truck drivers leave the warehouse with invoices; the last load goes out around 4AM and it is local. When the truck arrives at a Nugget store, the driver unloads and has store personnel sign the invoice. Nor-Cal transfers product ownership to Nugget and other customers 24 hours after it has delivered its orders. On the rare occasion that Nor-Cal has quality problems with products from Earthbound, it will contact its Earthbound sales representative to discuss the problem and provide the lot code information. Nor-Cal requires considerable operating capital; for its purchases, the terms are net 10 days, while the terms for its sales are net 14 days.

### Marketing and Retail Operations

Earthbound has succeeded in gaining distribution for its products in over 75 percent of US grocery stores. It also has a growing private label program.<sup>23</sup> Nugget stores display bulk Earthbound spring mix in a large bowl (labeled only as "spring mix", with a USA country of origin designation) alongside other organic produce. In a large refrigerated unit, Nugget displays 5-ounce and 1-pound clamshells of Earthbound spring mix, along with a variety of other Earthbound packaged salads, five-ounce clamshells of another organic spring mix brand, five-ounce bags of another brand of conventional

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<sup>23</sup> <http://thepacker.com/Private-label-growing-for-vegetable-products/Article.aspx?oid=1000654&fid=PACKER-SPECIAL-SECTIONS&aid=577>, accessed 05/01/10.

spring mix, and other packaged salads and numerous pre-cut vegetable and fruit products. Earthbound's 5-ounce product is labeled as "mixed salad greens" although it is identical to the 1-pound product which is labeled "spring mix." The target temperature for the refrigerated case and the backroom walk-ins at the Nugget stores is 41 to 42 degrees. Although Nugget does market some locally grown produce such as apples, mandarins, oranges and heirloom tomatoes, it does not sell any locally grown spring mix.

Nugget's only purchasing contract related to spring mix is with the firm that processes its conventional packaged salad products (including spring mix); the contract provides fixed prices on products and includes quarterly rebates to Nugget based on its purchasing volume. All of the products are supplied to Nugget with fixed prices by Nor-Cal. The only recent price adjustment occurred in 2008 when fuel costs soared. Nor-Cal receives promotional ad discounts each week from Earthbound that cycle between the different products: \$1.00 for bulk spring mix (3-pound case), \$1.20 per case of eight 5-ounce packages and \$3.00 per case of six 1-pound packages. Projected sales volumes at all Nugget stores (based on data provided through November 20, 2009) of Earthbound spring mix products are displayed in table 4. With projected sales of almost \$400,000, spring mix will comprise .14 percent of Nugget's total revenues. Surprisingly, more than half (59%) of the projected spring mix revenues and 63 percent in weight volume is derived from bulk product. The 5-ounce product only contributes 12 percent to spring mix revenues and seven percent of the weight volume.

Thus, Nugget's merchandising is generating significant margins on its spring mix products from Earthbound. The bulk product is identical to the Earthbound spring mix in clamshell packages and has the same retail price as Earthbound's 1-pound clamshell. It represents 59 percent of Nugget's Earthbound spring mix sales and has the highest gross margin, although it lacks the packaging protection and refrigeration of the clamshell product. Consumers apparently perceive the spring mix displayed loose in bowls as fresher than the packaged product, and/or prefer to control the amount of spring mix that they purchase. Additionally, the old adage of "buy big to save" holds with regard to spring mix; the per-pound price of the spring mix in the 5-ounce clamshell is almost double that of the 1-pound clamshell.

**Table 4. Nugget's Earthbound Spring Mix Sales, 2009\***

<b>Product</b>	<b>Sales, Lbs.</b>	<b>Paid to Nor-Cal, \$</b>	<b>Retail \$/lb</b>	<b>% of total Earthbound lbs.</b>	<b>% of total Earthbound \$</b>
5-oz clamshell	3,741	24,030	12.77	6.6%	12.1%
1-lb clamshell	17,600	64,855	6.49	30.9%	29.0%
Bulk	35,646	97,651	6.49	62.6%	58.8%
All Earthbound spring mix	56,986	186,536	6.90		

\*Projected, based on sales through 11/20/09

Based on an average wholesale price of \$2.74 per pound for its bulk spring mix, Nugget is capturing the largest share in the supply chain of the retail price--\$3.75 (57.8%). Earthbound's share is estimated to be \$1.16 (17.9%), followed by the producers' \$0.81 (12.5%), which includes freight costs. In this mainstream supply chain, the distributor, Nor-Cal, earns the smallest share of the retail price--\$0.77 (11.9%), which includes freight costs of approximately \$0.50.

## Food Miles and Transportation Fuel Use

The Earthbound spring mix sold through Nugget typically moves through the four-segment supply chain from the grower to the retail location (Figure 2). Based on an average trip of 30 miles from the Salinas Valley grower's field to Earthbound's processing facility with 130 cwt at 6 mpg fuel efficiency, the food miles total 30 miles and fuel usage is .08 gal/cwt; the comparable 45-mile trip in the desert requires .12 gal/cwt. Food miles from San Juan Bautista to Nor-Cal's warehouse in West Sacramento total 192 miles; the tractor-trailer rig hauling 400 cwt. achieves 5.5 mpg using .17 gallons/cwt for the 372 truck miles. The comparable segment from the desert region requires 618 food miles and 1250 truck miles, requiring .57 gal/cwt. The 16 food mile journey from the warehouse to the main Nugget store in Davis in a 250 cwt tractor-trailer rig with 6.0 mpg fuel efficiency requires .10 gal/cwt traveling 150 truck miles overall. Total fuel usage per cwt. is .35 and .79 gal/cwt, respectively for Salinas Valley-grown and desert-grown Earthbound spring mix. Large loads for each segment keep total fuel use per cwt. low.

Additionally, Earthbound is conserving fuel by utilizing clamshell packaging made from 100 percent post-consumer recycled polyethylene terephthalate (PCR PET) plastic. According to its website, virgin PET is made primarily from natural gas; Earthbound states that, annually, it is saving 424,224 million BTUs of energy.<sup>24</sup>

## Community and Economic Linkages

As a family-owned local firm, Nugget provides significant support to the local community. Its annual donations total approximately \$450,000 in cash and in-kind contributions, which compares very favorably with the retail giant, WalMart, which reported donations to local organizations totaling \$41,500.<sup>25</sup> Its primary activity related to local foods is being a top sponsor of the annual Village Feast which is organized by Slow Food Yolo and Davis Farm to School (as its major fundraiser) with food sourced from Davis Farmers Market vendors. Nugget also supports various agricultural organizations, including the Center for Land-based Learning, UC Davis' Good Life Garden, as well as food banks, homeless shelters, soccer programs, Little Leagues, high school graduation night celebrations and various other community organizations. Nor-Cal's primary support activity is donating surplus and/or "expired" produce to the local Senior Gleaners.

As local firms, Nugget and Nor-cal have significant local economic impacts, although the impacts are clearly attributable to a wide range of products, not just spring mix. Nugget employs approximately 1,500 employees, 60 percent of whom are full-time; its payroll totals approximately \$40 million.<sup>26</sup> It is recognized as a company that empowers its employees; Nugget has been rated among top 100 firms to work for by Fortune for the past five years, earning its highest ranking of #5 in 2010.<sup>27</sup> It pays approximately \$1.4 million in property taxes. Nugget's Chief Financial Officer estimated that three to four percent of Nugget's purchased goods are produced locally. Nor-Cal employs 140 employees, with a payroll of approximately \$6 million. It pays approximately \$140,000 in property taxes to Yolo County. Its major purchase from a local firm is about 340,000 gallons of diesel fuel annually for its 29 delivery trucks.

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<sup>24</sup> <http://www.ebfarm.com/aboutus/EnvironmentalStewardship/PCRPlastic.aspx>, accessed 04/20/10.

<sup>25</sup> Davis Enterprise. "Walmart Give \$467M to charities, including Yolo groups." May 9, 2010, page C-7.

<sup>26</sup> Personal communication with Dennis Lindsay, Chief Financial Officer-Nugget Markets, 11/12/09.

<sup>27</sup> <http://money.cnn.com/magazines/fortune/bestcompanies/2010/>, accessed 01/22/10.

## Prospects for Expansion

Nugget grew substantially prior to the recent recession. While it is likely that Nugget will expand its offerings of locally grown produce and source most, if not all, of this product through Nor-Cal, it appears unlikely that there is (or will be in the near future) enough supply of locally grown spring mix available to supply Nugget's stores; this situation is discussed further in the hybrid spring mix supply chain case.

Nugget, Nor-Cal and Earthbound are impacted by regulatory pressures. Earthbound has become very vigilant with its food safety practices because it packed the spinach that was determined to be the source of the highly publicized and tragic *E. coli* O:157 outbreak in 2006. It is a signatory of the California Leafy Greens Marketing Agreement, which is being considered as the model by USDA for a National Leafy Greens Marketing Agreement. The California program is also being considered as a model by the Food and Drug Administration as it begins to develop national safety standards for the growing, harvesting and packing of fresh produce.

Nugget's Produce Director indicated that Nugget is very proactive with respect to food safety issues. There are both time and paperwork costs to food safety regulations, but Nugget expects its standards to be superior to regulatory standards. He mentioned that many local county Environmental Health Departments are inconsistent in their enforcement of their rules.

Nor-Cal is concerned about the cost implications of regulations. Its management stated that the recently implemented standards by California's Air Resources Board cost Nor-Cal \$120,000 to retrofit its trucks.

## Key Lessons

Two general lessons emerge from this case study of the mainstream supply chain for spring mix. Over the past 25 years, Earthbound has built the nation's spring mix market from a tiny start-up to having distribution in 75 percent of grocery outlets nationally. The company is a highly reliable year-round supplier of organically grown leafy greens that are susceptible to a variety of weather and pest problems. Earthbound coordinates the crop flow from numerous spring mix growers in two different production regions, and annually executes the complex transfer of its processing operations and many of its management and technical employees from the Salinas Valley to the desert region. Like many other produce companies, the employees have to endure the hardships associated with splitting their residences in two areas. Earthbound has met its mission to "...bring the benefits of organic food to as many people as possible."

Secondly, Nor-Cal and Nugget have created a strong and highly cost-effective relationship as Nugget has simplified its produce distribution operations by partnering with Nor-Cal for the past 20 years. It relies on Nor-Cal to manage the purchase and transport of a highly diverse array of high quality produce. Nor-Cal's large truckloads minimize the hauling and handling costs. Each of Nugget's produce managers communicates directly with a contact at Nor-Cal. The consistency of Earthbound's supplies alleviates the need for much dialogue between Nor-Cal and Earthbound.

## Direct Market Case: Fiddler's Green Farm

Fiddler's Green Farm (Fiddler's) is a small organic farm located in Yolo County's Capay Valley, approximately 60 miles from downtown Sacramento. In 2010, there are at least 28 farming and

ranching operations in Capay Valley; most of these producers farm organically and are involved in direct marketing.

Cliff and Marian Cain founded Fiddler's in 1978. In 1982, the farm became the first Capay Valley farm to be certified organic. The Cains retired in 1989 and sold the farm to Steve and Sue Temple. After earning a BA in philosophy at UC Davis, Jim Eldon joined Fiddler's in 1991 as the farm manager. He quickly became a 50 percent owner in Fiddler's, and immediately began selling at the Davis and Marin Farmers Markets. In 1996, Eldon and his wife, Julie Rose, became the sole owners of the 37 acre farm.

After acquiring sole ownership to Fiddler's Green, Eldon expanded the operations by leasing an additional 25 acres nearby. He sold some produce wholesale, but mainly direct marketed his produce through farmers markets and a CSA program that he launched in 1992. During the spring in 1999, Eldon lost all of his crops due to a deep freeze and was forced to discontinue his CSA and lay-off all but one of his 15 employees.

Currently, Eldon is farming on 32 acres; he and Julie live on the farm with their two children. Their son, the oldest child, has been helping out since he was seven years old; now 16 years old, he often works at the farmers markets with Eldon. Like the neighboring farms, Eldon raises a variety of vegetable crops, which he markets directly.

Fiddler's has four full-time employees who work about eleven months of the year; they do not have any health insurance. The longest term employee has housing on the farm. In 2008, Fiddler's grossed about \$120,000, which is substantially less than the \$500,000 it generated before the 1999 crop disaster.

Fiddler's is of particular interest as a local foods case study because it is a direct marketer like many small farms. Furthermore, Eldon believes that it is too small to be profitable and is seeking ways to increase his revenues and profitability, without farming any additional acreage.

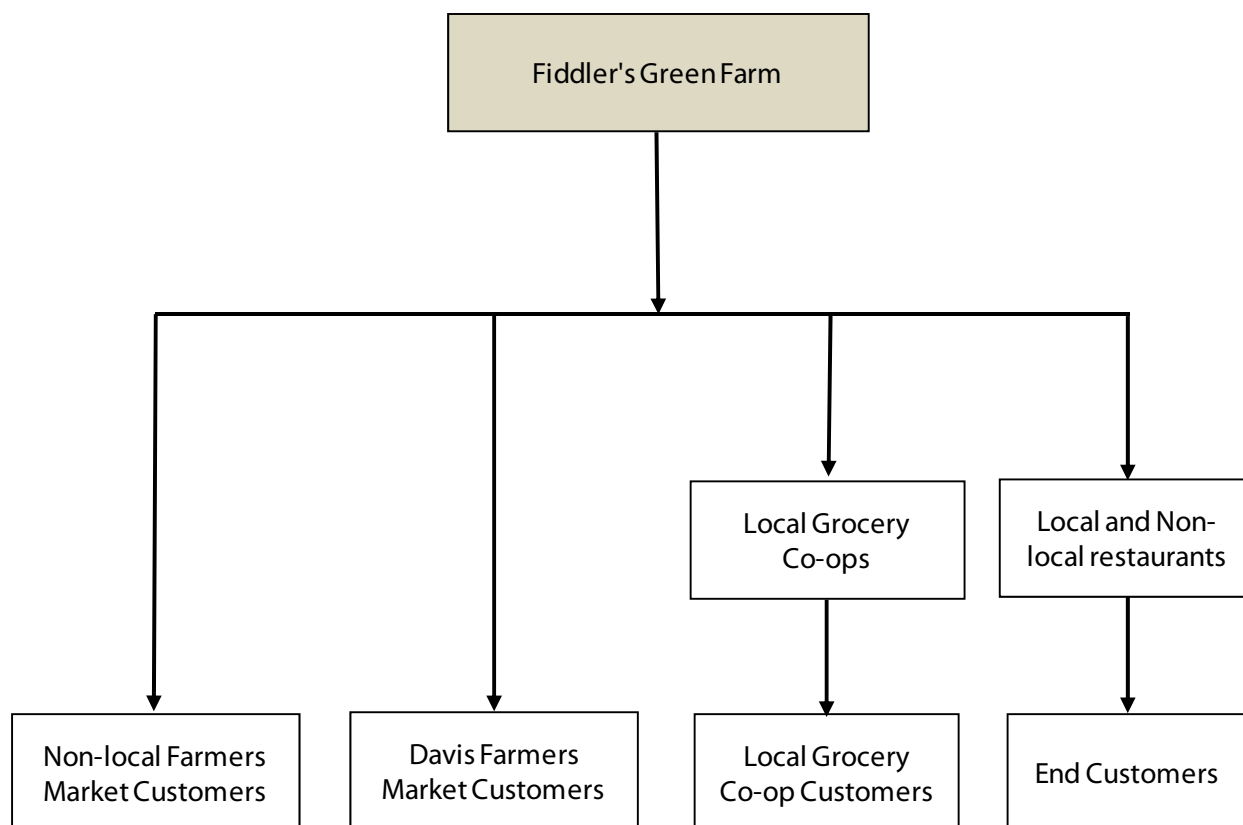
## Supply Chain Structure, Size and Performance

Product flows within Fiddler's supply chain are shown in figure 4. Fiddler's plays the central role in the chain, determining what to produce, growing all of the produce, setting retail prices, conducting all of the direct marketing, and maintaining relationships with all of its customers.

### Production

Fiddler's produces 90 to 100 different crops annually, including a variety of lettuces, beets, leeks, carrots, asparagus, melons, summer squash, peas, numerous salad greens and several types of bok choy. During fall, 2009, Eldon grew 45 crops; he remarked that one of the hardest things he had to learn when he started farming by himself was what specifically to grow and when to plant.

Fiddler's major equipment items include a 55-horsepower tractor, small Caterpillar tractor, seeder and mower. The buildings include a pole barn, packing shed, two coolers and an old toolshed. Eldon is usually planting crops nine months of the year. He uses a cold frame to start crops in the late winter. Eldon plants spring mix in 300 foot beds during the spring, and expands to 600 foot beds during the summer.



**Figure 4. Direct Market Supply Chain, Fiddler’s Green Farm**

### Harvesting and Packing

To prepare for a farmers market, Eldon puts together a load list of crops to take to the market. Fiddler’s employees harvest all of the crops (except asparagus and peas) the day before; asparagus and peas can be stored in the cooler for several days. As they are harvested, all leafy greens crops (such as the lettuces for spring mix) are covered immediately with wet burlap to retain their moisture. All of the harvested crops are brought in to the packing shed, hand-dunked in a 500 gallon stock tank and then rinsed. Employees bundle crops such as beets, bok choy and carrots into bunches. They pack produce for the grocery cooperatives and restaurants into standard pack boxes. Greens for the spring mix are drip-dried and loosely packed in four-pound boxes; the boxes are stacked tipped up to drain out any residual water. Eldon takes pride in being recognized for having produce that is “backyard garden fresh and clean.” When the weather is cool, Eldon loads his truck the evening before a farmers market.

### Marketing and Distribution

Fiddler’s markets its produce through three channels: farmers markets; grocery cooperatives; and restaurants. Eldon sells at three farmers markets: the Davis Farmers Market on Saturdays, and the Marin Farmers Markets (not local) on Thursdays and Sundays. In 2008, revenues at the Davis Farmers Market totaled approximately \$45,000 and \$20,000 at each of the Marin Farmers Markets. Sales to two

local grocery cooperatives and restaurants (one of which is local) generated the remaining 30% of the revenues.

According to USDA's 2007 Census of Agriculture, producers in California led the nation in revenues generated from sales directly to consumers. While the direct marketers in Yolo County averaged \$66,568, Fiddler's was above this with direct marketing revenues totaling approximately \$85,000.

The Davis Farmers Market (<http://www.davisfarmersmarket.org/>) was established in 1976. The market has a permanent covered area where most of the farmers have stalls. It has a waiting list of new producers; market guidelines provide stall space priority to local farmers while maintaining a diverse mix of products. It is not uncommon for the market to have 7,000 to 10,000 visitors during a single week. During the peak of the summer, there are about 45 to 50 farmers selling at the Saturday market, compared to about 40 farmers during the fall and spring, and about 30 farmers during the winter. The Davis Farmers Market was voted the nation's favorite large farmers market in 2009 in a contest organized by the American Farmland Trust.

The Davis Farmers Market is operated by the Davis Farmers Market Association, which runs the Saturday Market, Wednesday "Picnic in the Park" (from midMarch through October), Wednesday Winter Market (from November through midMarch) and Wednesday Market at the UC Davis Quad during Fall and Spring Quarters. Members pay a \$25 annual fee to the Association. The Association charges its farmer members a six percent stall fee for the Saturday market, with a \$30 per day minimum; nonmembers cannot sell at the Saturday market.

As certified farmers markets, both the Davis and Marin farmers markets require that farmers can only sell what they grow. Farmers must obtain their certificates annually from their county Agricultural Commissioner and submit the certificate to the market manager, and the scale used at the farmer's stand must bear a current seal from the county Sealer of Weights and Measures. A family member or employee may sell for an approved seller; employers or employees may be required to provide proof of employee status to the Davis Farmers Market Manager. The Davis Farmers Market also requires that sellers display a sign bearing the producer's business/farm name and county of origin and to carry \$1 million of liability insurance. Sellers who sample their products must abide by the regulations established by the county's Environmental Health Department. The Market also requires that sellers of "salad mix" post a notice indicating that the mix is field harvested and should be rinsed before serving; this notice is not required if the salad mix has been washed in a certified kitchen.

On Saturdays, Eldon leaves the farm at 5:15AM and arrives at the Davis Food Co-op by 6:15AM; after unloading several boxes of produce, he drives less than half a mile to the Davis Farmers Market, which is located at the city's Central Park. The market operates year-round and Eldon tries to maintain a year-round presence at this local market. Eldon is one of about a dozen farmers at the Saturday Davis Farmers Market who sell primarily vegetables. Five of the farms sell spring mix during various times of the year; three of them are organic. Prices for the organic spring mix range from \$5.00 to \$8.00 a pound. Eldon usually brings 40 pounds of spring mix to the Davis market and sells it for \$8.00 a pound at this market; between midJune and midOctober in 2009, he was the only vendor at the market selling spring mix. Fiddler's has a unique microclimate that enables Eldon to produce spring mix during the summer when it is too hot for other local farms to do so.

The Saturday market closes at 1PM. After taking down his stall, loading up his truck and turning in his load list, Eldon drives less than a quarter of a mile to make a delivery at a downtown Davis restaurant, Tucos Wine Bar and Café. Then he heads to Sacramento to make a delivery at the Sacramento Natural Foods Co-op, before returning to Fiddler's around 4:15 PM.

On Thursdays and Sundays, Eldon leaves Fiddler's at 5:15AM and drives 175 miles roundtrip (about three hours of driving time) to the Marin Farmers Market at the Civic Center in San Rafael (<http://www.marinfarmersmarkets.org>); often, he stops to pick up a friend in Point Reyes to help him at the busy market. Both markets operate from 8AM to 1PM. His restaurant customers pick up their produce there; the market has designated parking for chefs. Marin's Sunday market is the third largest farmers market in California; during the peak summer season, nearly 200 local farmers, specialty food purveyors and artisans are selling at the market. Eldon remarked that he sold 600 pounds of melons at this market on a busy summer Sunday in 2009.

Usually, Eldon brings only ten pounds of spring mix to the Marin market and sells it for \$6.00/pound; he is competing with growers from Sonoma County and the coastal South Bay region who have more favorable growing conditions. The Marin Farmers Markets operate year-round; Eldon normally sells at these markets from mid-March through December.

Eldon commented that he enjoys talking to new and returning customers at the markets. New customers often ask inquire about the size and location of his farm, and his farming history. Both new and returning customers often ask questions about specific produce items, especially about how they taste and ways to prepare them. Numerous customers have asked him to start a CSA. Eldon made connections with the chefs from the restaurants that he sells to at these farmers markets.

Overall, Fiddler's revenues totaled \$120,000 in 2008. Since Fiddler's coordinates its marketing activities in different channels during three marketing days, it is helpful to separate the marketing costs and revenues for each day (table 5).

A typical busy Saturday for Eldon requires approximately 95 miles of driving round-trip and 11 hours of Eldon's time for driving, setting up, selling and taking down at the Farmers Market, and delivering produce to a restaurant and two local food cooperatives. His workers spend eight hours to prepare the loads and load the truck; the average hourly cost of this labor is \$9/hour. Setting the cost of vehicle operation at \$0.637/mile and the opportunity cost of Eldon's labor at \$18.83 per hour, the total cost for 46 trips over the course of a year is \$18,349 (including stall fees at the farmers market). With annual sales through the channels served by these deliveries totaling \$70,000, this cost represents 26 percent of Fiddler's associated sales revenues.

Eldon's Thursday and Sunday marketing days require 10 hours of Eldon's time for driving, setting up, selling and taking down at the Farmers Market. All other marketing costs are the same as those on Saturday, except that his roundtrip mileage is now 175 miles. The total cost for 36 trips over the course of a year is \$14,584 for each market day (including stall fees at the farmers market). With annual sales through the channels served by these deliveries totaling \$25,000 for each market day, the marketing costs represent 58 percent of Fiddler's associated sales revenues.

**Table 5. Fiddlers Green Farm Marketing Costs & Revenues, 2008**

<b>Marketing day &amp; activities</b>	<b>Hours or miles</b>	<b>Rate (\$)</b>	<b>Weeks</b>	<b>2008 cost (\$)</b>	<b>Revenues (\$)</b>	<b>Marketing Costs/ Revenue %</b>
<b>Saturday-Davis Farmers Market, Davis &amp; Sac Food Co-op, Restaurant</b>						
Eldon's labor	11	18.83	46	9,528		
Packing shed workers	8	9	46	3,312		
Transportation	95	0.637	46	2,784		
Market fees				2,725		
All Saturday marketing activities				18,349	70,000	26.2%
<b>Thursday-Marin Farmers Market, Restaurants</b>						
Eldon's labor	10	18.83	36	6,770		
Packing shed workers	8	9	36	2,592		
Transportation	175	0.637	36	4,013		
Market fees				1,200		
All Thursday marketing activities				14,584	25,000	58.3%
<b>Sunday-Marin Farmers Market, Restaurants</b>						
Eldon's labor	10	18.83	36	6,779		
Packing shed workers	8	9	36	2,592		
Transportation	175	0.55	36	4,013		
Market fees				1,200		
All Sunday marketing activities				14,584	25,000	58.3%
<b>Total Marketing Activities</b>				<b>47,516</b>	<b>120,000</b>	<b>39.6%</b>

Sales to the grocery co-ops on Saturdays bolster Fiddler's revenues and bring down its marketing expenses relative to revenues. Recent research of other organic direct marketers in the area indicates that Fiddler's 40 percent marketing expenses-to-revenues ratio is not unusually high, and that its comparable ratio on Saturdays of 26 percent demonstrates significant marketing effectiveness.<sup>28</sup>

Fiddler's produces about 2,000 pounds of spring mix, which accounts for about 11.5 percent of the farm's total revenues. Fiddler's allocation of revenues is shown in table 6 for spring mix by market channel.

Based on his recent sales of spring mix to the Sacramento Natural Food Cooperative, Eldon figured that he could sell 240 pounds a week to the store for retail sales and its deli; it appears that selling to this cooperative for \$4/lb. is not optimal since his net revenues from selling the spring mix at the Davis Farmers Market for \$8/lb., less 26.2 percent for his marketing costs, are \$5.90.

<sup>28</sup> Hardesty, S. and P. Leff. 2010. "Determining marketing costs and returns in alternative marketing channels." *Renewable Agriculture and Food Systems*, 25:1, 24-34.

**Table 6. Fiddler’s Spring Mix Revenues by Channel**

<b>Channel</b>	<b>\$/Lb</b>	<b>Estimated Revenues (\$)</b>
Davis Farmers Market	8	8,800
Marin Farmers Markets	6	3,600
Restaurants	5	1,000
Grocery Co-ops, Davis & Sacramento	4	400
All Channels		13,800

Like other small farms in the area, Fiddler’s does not segregate production costs for the wide variety of crops that it grows. No cost studies have been prepared for such diverse farming operations or for spring mix. As previously indicated, Eldon is concerned that, currently, Fiddler’s is not profitable; he is considering how to become profitable without expanding his acreage. His concern is valid; with 2009 payroll expenses and revenues estimated at, respectively, \$90,000 and \$100,000, the \$10,000 balance does not cover Fiddler’s estimated marketing expenses (which total over \$29,000 when adjusted for the packing shed labor which is already counted as payroll expenses), or nonlabor production input costs and various overhead expenses. Fiddler’s revenue shortfall in 2009 due to the unavailability of tomato and pepper transplants in the spring contributed to this difficulty.

### Food Miles and Transportation Fuel Use

Eldon integrates deliveries to the grocery cooperatives and restaurants with his trips to the farmers markets. He was relying on Fiddler’s 14-year-old box truck (unrefrigerated) with 270,000 miles to transport his produce, but it now needs to a new engine, so Eldon is currently driving to his markets in his pick-up truck that averages 12 mpg. On Saturdays, he first delivers to the Davis Food Cooperative and then drives less than a mile to the Davis Farmers Market (35 food miles). After the market, he makes deliveries to a Davis restaurant, Tucos Wine Bar and Café, and the grocery cooperative in Sacramento, driving another 20 miles into Sacramento, and 55 miles back to the farm; the roundtrip mileage totals 105 miles. Food miles to the Marin Farmers Markets and restaurant customers total 85 miles. Eldon’s loads vary from 800 pounds to 2,000 pounds, for an average of 1400 pounds. Thus, fuel usage averages 63 gallons and 1.04 gal/cwt of produce for the two market routes.

### Community and Economic Linkages

Eldon noted that he benefited significantly from participating in the Community Alliance with Family Farmers’ Lighthouse Farm Network, which was designed to connect farmers and other agricultural professionals who met once a month to share technical information about biologically-based farming practices. Despite his busy schedule, Eldon has been generous in sharing his time with civic organizations. He served on the Marin Farmers Market Board of Directors for ten years and one term on the Board of the Community Alliance with Family Farmers. He is now in his fourth year as a member of the Davis Farmers Market Board of Directors, where he serves as the Treasurer. Eldon was also on the Certified Farmers Market Advisory Committee for California’s Department of Food and Agriculture for two terms. He supports food programs for low income residents by donating unsold produce from his farmers market loads to two community non-profits, STEAC in Davis and Meals of Marin in San Rafael.

Fiddler's is a full-time business for Eldon; his wife, Julie, is employed full-time off the farm. Fiddler's payroll expenses total approximately \$90,000 for the four employees who live close by. Eldon purchases his fuel for the farm locally, as well as his farm implements. His pump and cooler maintenance service providers are also local. Since Fiddler's sells only fresh produce, it does not rely on any processors. Overall, Fiddler's economic impact on the local economy is limited because of its relatively small size. If Fiddler's were to cease operations, another farming operation would be likely to take over farming the land.

## Prospects for Expansion

Eldon expanded Fiddler's rapidly after becoming a partner, and then suffered significant losses when a freeze hit his plantings in the spring of 1999. He was forced to discontinue his CSA program and has not restarted it. He is concerned that, because of losing his source for transplants last spring, his farm will not be profitable in 2009. He has considered starting up another CSA, since farmers typically earn full retail prices for their CSA programs while incurring lower marketing costs than at farmers markets. However, Eldon is hesitant to do so for two reasons: it would involve considerable administrative effort to develop and operate the CSA; and he would face considerable competition, since at least nine farms within 25 miles of Fiddler's currently operate CSAs. Alternatively, Eldon could consider a hybrid form of a CSA, perhaps for a major employer in Marin County that could be piggybacked to his trip to the Thursday Farmers Market.

Eldon is an effective marketer at farmers markets; his produce is attractively displayed at his stall and he is approachable and engaging. It appears that Eldon's best prospects for renewed profitability appear to be with expanding into new crops on his existing acreage. Fiddler's earns a considerable premium for its spring mix at the Davis Farmers Market during the summer and early fall when no other farmers have it. His challenge is to find similar niche crop(s) that can command premium prices to bolster his revenues.

Eldon's major concern with policy issues is the time it takes to understand new regulations and recordkeeping effort that is required. He does not have any administrative support and must find the time to complete all required reports himself. When asked specifically about potential food safety regulations, Eldon did not express much concern. He commented that he does not feel vulnerable to a food safety outbreak with his leafy greens because they are a "loose leaf" product, rather than packaged.

## Key Lessons

This case study of Fiddler's demonstrates three general lessons about direct marketing. First, it exemplifies the synergies in distribution possible from marketing through different channels. When Eldon travels to a geographic market area, he is selling through two or three channels, which means that his marginal marketing costs in the secondary channels are minimal. During the summer, Eldon may be able to enhance Fiddler's profitability by producing and selling more spring mix at the Davis Farmers Market when he is the only spring mix marketer.

Fiddler's situation also illustrates that there can be substantial competition in direct marketing channels. Specifically, Eldon has to sell his spring mix at the Marin Farmers Market for \$6/lb. instead of the \$8/lb. he earns at the Davis Farmers Market, where there are no other farmers selling high quality

product over a long period. Similarly, Eldon senses that his prospects in re-launching his CSA program could be difficult since there are several local organic farmers who already have strong CSA programs. While the growth in direct marketing has enabled many smaller farmers to enter the marketplace, farmers markets, CSAs and other forms of direct marketing often now involve significant competition among farmers selling to a relatively small number of customers.

Additionally, Fiddler's situation exemplifies the vulnerability faced by smaller producers who rely heavily on directly marketing. Fiddler's has reduced its marketing risk significantly by growing a very diverse set of crops. However, such diversification did not protect Fiddler's from the catastrophic impact of the 1999 spring freeze; the farm's revenues plunged from \$500,000 to under \$150,000 as it closed its CSA program and reduced its acreage. Though not as severe, the lack of tomato and pepper transplants in the early spring also damaged Fiddler's significantly in 2009, as did the breakdown of the box truck that Eldon has relied on for so long to haul his produce. For a larger farming operation, the loss of a single supplier or a single vehicle is not likely to have such a severe impact. However, as a small direct marketer, it is essential for Fiddler's to have a reliable delivery vehicle to travel to its markets, and to be able to market as wide of a range of produce as early (and as late) in the season as possible, in order to earn premium prices when product availability is limited.

## Intermediated Case: Davis Food Coop

Davis Food Cooperative (referred to as the Co-op) is owned by approximately 10,000 households in Davis. The university-oriented community is located 15 miles west of downtown Sacramento. The full-service grocery store ([www.davisfood.coop](http://www.davisfood.coop)) carries approximately 18,000 products and features a sushi vendor, hot food to go, hot soup, salad bar, custom sandwiches and store-baked pastries.

The Co-op is governed by a 10 member board that includes one store employee. The board recently adopted a Statement of Ends (similar to a mission statement) that includes the following: "We are the best source of healthful, sustainable, higher quality, and locally grown and produced foods." In writing about this statement in a recent newsletter, the Co-op's general manager further noted "...Buying from local growers makes sense for any number of reasons, including flavor, freshness, reduced transportation, and preservation of local farms."<sup>29</sup> Rather than trying to compete on a price basis with other grocery stores, the Co-op management's strategy is to know its customers and to understand their needs.

The Co-op has operated at the same location for over 25 years, and it is open seven days a week. The 25,000 square foot store is large by grocery co-op standards, but considerably smaller than the median United States grocery store of 46,755 square feet.<sup>30</sup> It is completing an extensive remodeling project that began in 2006. In 2008, its revenues totaled \$18.1 million, making it the third largest cooperative grocer in California. The Co-op does not have a warehouse; numerous suppliers deliver their products directly to the store.

The Co-op plays a critical role as the retail hub for consumers, ordering from numerous sources and selling the product. Its produce department carries over 900 items during the year; over half of the

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<sup>29</sup> <http://www.daviscoop.com/newsletter/dfcnews10-09.pdf>, accessed 11/21/09.

<sup>30</sup> [http://www.fmi.org/facts\\_figs/?fuseaction=superfact](http://www.fmi.org/facts_figs/?fuseaction=superfact) Accessed 11/21/09.

items are organic. Produce sales for the 2008-09 fiscal year totaled \$3.0 million; approximately 80 percent of produce sales are organic. It is staffed by 13 employees (9 full-time, 4 part-time). Elizabeth Davidson has been the Co-op's produce manager for the past 15 years. When placing orders, she does not use any forecasting models; instead, she relies on her past experience. The Co-op does not have any contracts with its produce suppliers.

Although California is the nation's leading supplier of spring mix, a distinct feature of this intermediated spring mix supply chain in the Sacramento area is that the local producers are not part of the Salinas Valley which is approximately 150 miles away. Rather, these farmers grow numerous leafy greens along with an extensive mix of other vegetable crops and fruit crops; several also engage in livestock and/or poultry production. All of the spring mix, head lettuce and leaf lettuce sold by the Co-op is organic. Spring mix is sold in bulk and clamshell packages.

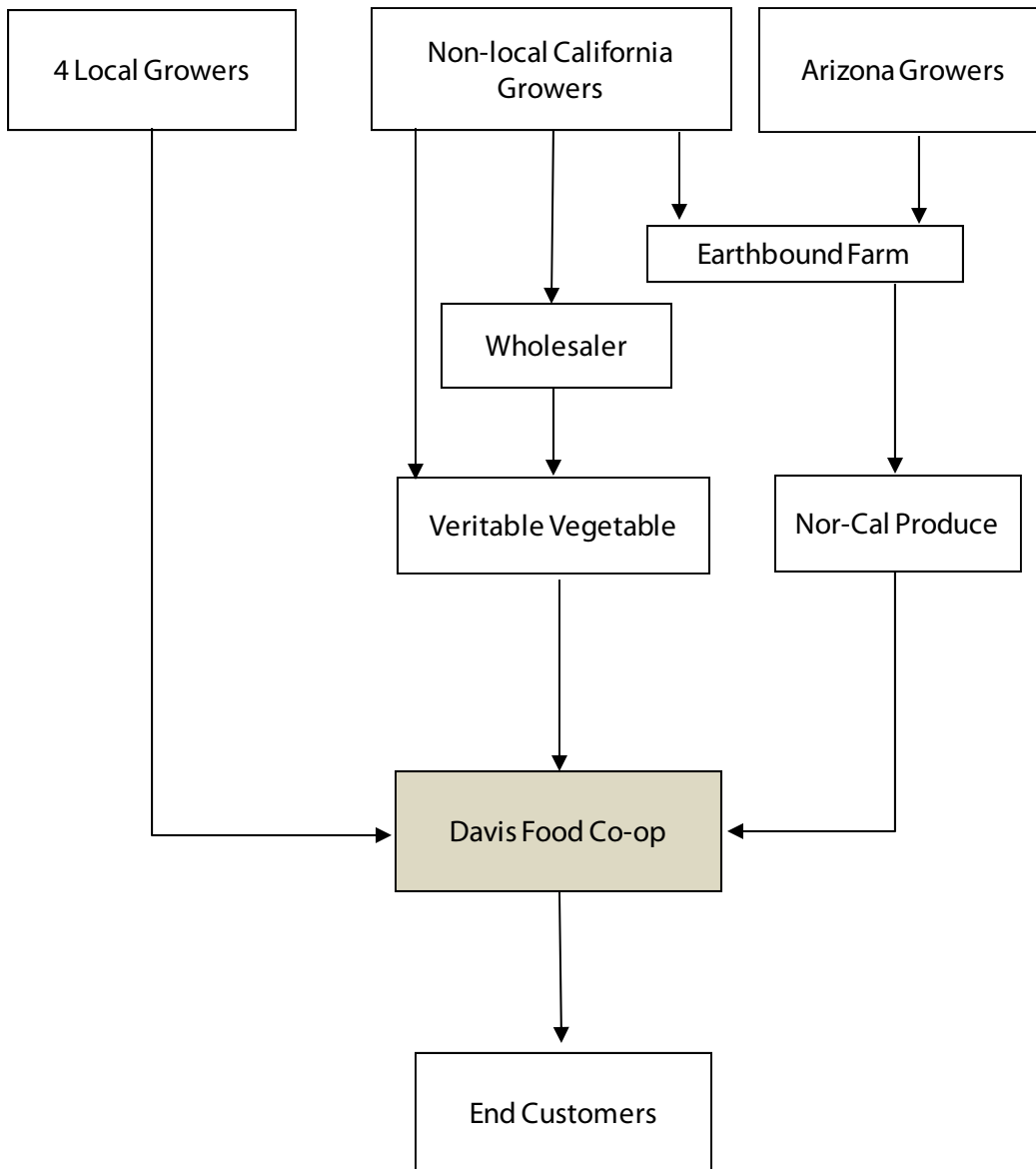
## Supply Chain Structure, Size and Performance

The Co-op's supply chain for spring mix is shown in figure 5. The store sources spring mix from suppliers with three distinct organizational profiles: four local farms who supply bulk spring mix, a distributor who supplies bulk spring mix, and a large distributor that supplies only packaged spring mix; all of these sources supply other produce items as well to the Co-op. It strives to source bulk spring mix exclusively from local farms when it is available. When locally grown spring mix is not available, it purchases bulk spring mix from a San Francisco-based produce distributor, Veritable Vegetable. Earthbound Farm's (Earthbound) spring mix and other salad mix products in clamshell packaging are sourced year-round from a local produce distributor, Nor-Cal Produce (Nor-Cal, who is also the sole distributor for the mainstream case, Nugget Markets). These three supply chains, along with their ordering, delivery and payment procedures, are described below.

### Production-Local Spring Mix

The Co-op purchases locally grown spring mix from four farms; they are all located in Yolo County, which has the highest agricultural production of the four counties in the Sacramento area. All four local farms have coolers onsite for holding their harvested produce. The locally grown product represents--at most--one percent of the Co-op's spring mix sales. The Co-op is not the primary market for spring mix grown by local growers. Terra Firma and two other local farms are all approximately the same size. They market spring mix during the spring, late fall and early winter, if weather conditions are appropriate. During the fall, hot weather can ruin the crop. Production during the winter and spring is adversely impacted by lack of sunshine, heavy rains, and mildew.

Terra Firma and two other farms market their spring mix primarily through their CSAs. Although located within 20 miles of the other farms, the fourth farm--Fiddler's Green-- has unique climatic conditions that enable it to extend its spring mix production through much of the hot summer. More information about Fiddler's Green Farm is presented in the direct marketing case in which it is the focal entity.



**Figure 5. Intermediated Supply Chain, Davis Food Co-op**

Thus, spring mix is marketed to the Co-op for a relatively short period even when weather conditions are favorable. During periods of short supply, local growers often keep spring mix on their wholesale product availability lists but will price it high in order to keep the cooperative’s purchases low. The Co-op’s produce manager strives to rotate her orders among the local growers. However, due to growing conditions and pricing, Terra Firma is the Co-op’s primary spring mix supplier. It was founded in 1985 by one of the three current partners, Paul Holmes. The second partner, Paul Underhill, joined about ten years later. A third partner, Hector Melendez, was added about three years ago; he had worked for the farm for many years as a farmworker. Terra Firma is highly diversified; it operates year-round and

grows approximately 60 crops annually including fruits, vegetables, nuts and grains on 240 acres. It has been selling spring mix to the Co-op for about 20 years.

Terra Firma is structured as an S-corporation. For most of the year, it has 35 full-time employees. It brings in an additional 130 employees to hand-harvest a small grain for three weeks that it markets as birdseed. Terra Firma earns approximately 40 percent of its revenues from its 1,400 CSA memberships. Although farmers markets used to be a significant sales outlet for Terra Firma, it discontinued its farmers market program with the exception of one fledgling local market that generates less than one percent of its revenues. Terra Firma earns about 15 percent of its revenues from wholesale sales to the Co-op, another grocery cooperative in the Sacramento area and the Whole Foods store in Sacramento. Restaurants account for approximately five percent of Terra Firma's revenues. The remaining 40 percent of Terra Firma's revenues come from sales to distributors, including two in the Sacramento area. None of Terra Firma's restaurant or distributor customers in the Sacramento area or the Bay Area buys any spring mix from Terra Firma since they can source product grown in the Salinas Valley that has more consistent quality and a longer availability period.

Terra Firma is known for its heirloom tomatoes, which is also sells to the Co-op. It generates approximately two percent of its revenues from spring mix and does not consider spring mix to be a highly profitable crop. Rather, it grows spring mix because it is a popular item with its CSA members during the fall and winter months; half-pound bags are included in CSA boxes. Terra Firma grows all of its spring mix greens from seed. The mix includes a variety of baby lettuces—red perella, red oakleaf, red leaf and green romaine, along with frisee, spinach, radicchio and arugula. It starts the frisee and radicchio in a greenhouse.

Terra Firma harvests the greens in its spring mix by hand early in the morning. The harvested greens are transported to a packing shed where they are washed together in tubs that have been sterilized with bleach. After washing, the greens are dried in mechanical salad spinners that hold approximately eight pounds of spring mix. The spun greens are packaged in perforated salad bags which are placed into four-pound boxes for delivery to the two grocery cooperatives and eight-pound boxes to be bagged for CSA subscribers. The boxed product is placed into a refrigerated truck and hauled three miles to one of Terra Firma's cooler. The spring mix is stored at 38°F in the cooler.

Holmes noted that Terra Firma stopped growing spring mix during January 2009 because of heavy rains. They began replanting the lettuces in early September 2009 but had to wait until early November to harvest spring mix for the CSA boxes because 100-plus degree temperatures in September followed by heavy rains in early October ruined Terra Firma's first two spring mix plantings.

### Distribution

The specific distribution details related to each supplier are described below. The delivery process is the same for all suppliers. The deliveries are on pallets which makes unloading and storage easier for the Co-op. All of the spring mix products are delivered to the store back-door, and the spring mix is unloaded and moved into the Co-op's 32-foot by 12-foot walk-in cooler where it is stored at 34 to 40 degrees for usually no more than two days. Spring mix is a high rotation item. The Co-op's payment process is identical for all of its suppliers. All of the suppliers provide an invoice when making a delivery. Every load is inspected by the Co-op upon delivery. Outright rejections are rare for spring mix, because the Co-op's produce manager emphasizes the importance of advising her of quality and quantity problems ahead of the delivery. The Co-op pays all of its suppliers, including local farmers, by check within 14 days of the delivery. Occasionally, other local growers will approach the Co-op's

produce manager, wanting to sell produce to the store on a cash basis; she explains the Co-op's purchasing and payment policies to them.

### Distribution-Local Spring Mix

The local farmers email availability lists to the Co-op's produce manager daily; she submits produce orders to its local grower suppliers twice a week. She compares the prices for spring mix when more than one local grower has the product available; sometimes, one farm may offer a sale price because they have excess supply. Terra Firma's price for spring mix is typically slightly lower than those of the other three growers. The Co-op's produce manager phones in her order for spring mix, along with other produce items, to one of the growers twice a week. Terra Firma, as well as the other local growers, will advise the Co-op's produce manager about any quality and quantity problems with the spring mix during the call, which she remarked is much better than receiving a "shorted" order and/or poor quality product. Last fall, Terra Firma suddenly stopped selling spring mix to the Co-op; its butternut squash crop had failed, which caused Terra Firma to substitute larger quantities of spring mix in its CSA boxes. If the quality of Terra Firma's spring mix is poor, the Co-op will ask the other farms about the quality of their spring mix, and place an order with one of them if the quality is good. If none of the local growers have good quality spring mix, she will order the nonlocal product from a San Francisco-based organic produce distributor, Veritable Vegetable.

The local farmers are all located within 45 miles of the Co-op. Terra Firma delivers to the Co-op as part of its local delivery route in a diesel, refrigerated truck. On Tuesdays, the truck also delivers to the other local grocery cooperative, another local grocery store, and two local distributors. On Fridays, the truck also delivers to the other local grocery cooperative, and the local CSA drop sites. Terra Firma does not itemize a delivery charge in its invoices. Terra Firma and the other local farmers usually make their deliveries to the Co-op during the early afternoon on Tuesdays and Fridays.

### Distribution-Bulk Nonlocal Spring Mix

Veritable Vegetable supplies the Co-op with nonlocal, bulk spring mix, as well as other organic produce items. Founded in 1974, Veritable Vegetable is one of the pioneers in the organic produce industry and the nation's oldest distributor of certified organic produce. Its distribution area includes California, New Mexico, Arizona and Colorado; however, 75 percent of its sales is attributable to customers in California. VV's 300 customers include retailers, restaurants and other regional distributors. It operates a 25,000 square foot warehouse facility containing over 9,700 items, of which 97 percent is certified organic. It buys from 340 produce vendors and employs over 80 full-time staff.

Veritable Vegetable's mission is to understand and provide for the unique needs of each of its customers. The Co-op has been buying produce from the firm for 30 years. Its primary supply period for bulk spring mix is February through September; however, the Co-op expects Veritable Vegetable to be a "back-up" supplier during the local spring mix season. When it is available, Veritable Vegetable purchases bulk spring mix grown in California's Salinas Valley. During the "offseason", it sources spring mix grown in California's Imperial Valley and Yuma, Arizona; however, this spring mix is ordered from Salinas Valley processors, so shipments to Veritable Vegetable come from the Salinas Valley. Some of Veritable Vegetable's bulk spring mix is supplied by Earthbound Farm, the firm that processes the packaged spring mix products sold by the Co-op that are purchased through a different distributor. Detailed information about Earthbound's production, harvesting, processing and transportation practices are provided in the mainstream case, Nugget Markets.

Veritable Vegetable emails availability lists to the Co-op's produce manager daily; she submits orders to the firm four days a week. Veritable Vegetable makes the deliveries the next day; it has the capability to deliver to the Co-op six times a week. Deliveries are made in 48-foot tractor trailer; the truck is usually routed to go further east to Grass Valley for 250 roundtrip miles, or further north to Chico for 450 roundtrip miles.

### Distribution-Packaged Spring Mix

The Co-op purchases packaged, nonlocal spring mix year-round (as well as other produce) from a produce distributor in the Sacramento area, Nor-Cal. Nor-Cal's warehouse is located 16 miles from the Co-op, making it the Co-op's closest produce supplier. Its sourcing and transportation practices are described in detail in the Nugget Market case study. Nor-Cal's sales representative for the Co-op used to work in the Co-op's produce department.

Nor-Cal emails availability lists to the Co-op's produce manager daily. She phones in her order to Nor-Cal and relies on her salesperson to advise her of any unusual supply conditions. Nor-Cal delivers to the Co-op six days a week. Virtually all of the Co-op's packaged spring mix is one organic brand, Earthbound. The Co-op began purchasing Earthbound's packaged salads in clamshells in January, 2007 when its new refrigerated produce case was installed; it had previously purchased a different salad brand packaged in bags. Earthbound is headquartered in the Salinas Valley; Nor-Cal also supplied the Co-op with another brand, Organic Girl, for two weeks during 2009; this new company is also based in California's Salinas Valley. The Co-op's produce manager discontinued Organic Girl after deciding that Earthbound's product was of higher quality. In 2009, the order size has averaged 50 cases for a variety of Earthbound salad products, including the spring mix.

### Marketing and Retail Operations

The Co-op displays bulk spring mix with other organic leafy greens; nonlocal product is labeled USA. Sometimes, the bulk spring mix has been processed by Earthbound; however, no brand information is included in the bulk display. When local spring mix is available, the sign indicates "Local/CA" because there is always a possibility that the local product will sell out and only nonlocal bulk spring mix is available until the next delivery by a local grower. Currently, the Co-op is carrying Earthbound's 5-ounce and 1-pound clamshell packages of spring mix, as well as 12 other Earthbound packaged salad products.

Nor-Cal has locked-in pricing on all of Earthbound's spring mix products to the Co-op. Nor-Cal receives ad discounts each week from Earthbound that rotate between the different sizes. The discount is \$1.00 on the 3 lb. bulk product, \$1.20 on the case of eight 5-ounce packages and \$3.00 on the case of six 1 lb. packages. The Co-op runs ads frequently on packaged salads. The store has the discretion to keep all or part of the promotional allowance to meet its margin targets.

The Co-op's average retail prices per pound and sales volumes for the different spring mix products are displayed in table 7. Its sales of spring mix as a proportion of total produce sales range from five percent to 15 percent a month, peaking during the spring and summer. Based on actual sales through November 22, 2009, sales of spring mix for the entire year are projected to total \$48,427 and 8,753 pounds. Poundwise, almost two-thirds of the Co-op's spring mix is sold in bulk and 26 percent is attributable to the 1 lb product. However, this proportion drops to 28 percent on a retail dollar volume basis; the per pound price of the 5-ounce package is almost double that of the 1 lb. package and the price of the bulk product is 21 percent lower than that for the 1 lb package.

**Table 7. Co-op's Spring Mix Prices and Sales, 2009\***

<b>Product</b>	<b>Average Price/Lb.</b>	<b>Pounds Sold</b>	<b>Sales</b>	<b>% of Total Lbs Sold</b>	<b>% of Total \$ Sales</b>
Earthbound, 5-ounce	\$11.29	683	\$7,705	7.8%	15.9%
Earthbound, 1-pound	\$5.90	2,265	\$13,365	25.9%	27.6%
Bulk, local	\$5.99	100	\$599	1.1%	1.2%
Bulk, not local	\$4.69	5,705	\$26,757	65.2%	55.3%
Total		8,753	\$48,427	100.0%	100.0%

\*Projected, based on sales through 11/20/09

The produce manager perceives strong demand for local produce in general; however, demand for local spring mix is not particularly strong. Consumers have complained to her that the product does not seem to last as long as the packaged spring mix that they purchase. She remarked that “they don’t understand that it is not the same product”, and described Earthbound’s bulk spring mix as being very consistent in regard to the mix of greens that are include and that it holds better.

As a consumer-owned grocery cooperative, the Co-op is committed to purchasing from local growers as part of its mission of supporting the local community. Once a year, the Co-op’s management visits one of the local farms and has a lunch meeting with the growers. The Co-op’s produce manager has established good working relationships with local farmers during her 15-year tenure. She believes that the communications between her and the local farmers regarding the quality and availability of their produce are essential for having a successful relationship. The other half of this values-based relationship is that she understands why there can be intermittent disruptions in the supply of locally grown spring mix; such disruptions would not be acceptable to a large grocery chain.

### Food Miles and Transportation Fuel Use

As indicated in table 8, food miles for Earthbound’s packaged spring mix totaled a weighted average of 414 miles for spring mix grown in the Salinas Valley and in the desert; the detailed calculations are reported in the Earthbound case. Loads averaging 13,000 pounds are hauled from the farm to Earthbound’s plant; the average distance traveled is 36 miles. Hauling from the Earthbound plants to Nor-Cal’s warehouse in a 50-foot refrigerated truck involves the greatest fuel use. The Co-op is only 16 miles from Nor-Cal’s warehouse but the entire delivery route is 150 miles for the truck with a 48-foot trailer. Given the roundtrip nature of the hauling and 6 mpg fuel efficiency, the weighted average total fuel used for all legs of this supply chain totals .52 gal/cwt of spring mix.

Transportation for the nonlocal bulk spring mix supply chain involves the same transportation as for Earthbound product for the first two legs. The third leg, from Veritable Vegetable’s warehouse in San Francisco to the Co-op in Davis as part of a longer route to Chico, increases the food miles from 16 to 75 and roundtrip miles from 945 to 1145; consequently, total fuel usage in the nonlocal bulk spring mix supply chain rise to .65 gal./cwt, assuming six mpg. fuel efficiency for most of the miles.

The local grower clearly provides the shortest supply chain and travel. Food miles traveled drop to 34 miles and fuel use for the 16-foot refrigerated box truck averaging fuel efficiency of 10 mpg. is .18 gal./cwt of spring mix, 72 percent less than the highest fuel usage of .65 gal/cwt for the nonlocal bulk spring mix supply chain. Low food miles do not always translate into low fuel use; this result is due to

the use of the local grower’s use of a relatively large truck that includes deliveries of various types of produce at CSA drop sites and other grocers as part of the delivery route.

**Table 8. Food Miles & Fuel Usage By Supply Chain**

<b>Supply Chain</b>	<b>Food Miles Traveled</b>	<b>Roundtrip Miles</b>	<b>Miles/ Gallon</b>	<b>Gallons/ Load</b>	<b>Load (100 lbs.)</b>	<b>Gallons Fuel Use/ 100 lbs.</b>
<b>Packaged Spring Mix--Blended for Earthbound's Salinas and Desert Production</b>						
Farm to Earthbound	36	72	6	12.0	130	0.09
Earthbound to Nor-Cal	362	723	5.5	131.5	400	0.33
Nor-Cal to Co-op	16	150	6	25.0	250	0.10
<b>Total</b>	<b>414</b>	<b>945</b>				<b>0.52</b>
<b>Bulk Nonlocal Spring Mix--Blended for Salinas &amp; Desert Production</b>						
Farm to processor	36	72	6	12.0	130	0.09
Processor to VV	304	603	5.5	110.5	400	0.28
VV to Co-op	75	350	6	58.3	250	0.23
<b>Total</b>	<b>415</b>	<b>1030</b>				<b>0.60</b>
<b>Bulk Local Spring Mix</b>						
Farm to Co-op	34	105	10	10.5	60	0.18

### Community and Economic Linkages

The Co-op is engaged in a variety of community activities, none of which is specifically related to spring mix. It offers a variety of cooking classes and holds wine and beer tastings that bring community members together. Holiday celebrations include: breakfast with the Bunny; a Haunted House outside the store; Breakfast with Santa. Its monthly newsletter includes grower profiles, as well as healthy recipes.

One of the Co-op’s principles is “Concern for the Community.” The Co-op provides substantial support to the local community, such as educating local school children about whole grains and eating seasonally, handing out recipes and samples of seasonal foods at a farmers market, organizing community traditions such as the Children’s Candlelight Parade and the Holiday Meal (which raised over \$14,000 in 2008), sponsoring various community programs and providing community fund grants to support various charities, including the local Society for the Prevention of Cruelty to Animals, Land Trust, Red Cross, Youth Soccer League, and the campus radio station.

Terra Firma’s founding partner, Paul Holmes, remarked that the Co-op’s willingness to buy from local, smaller producers has given them the opportunity to establish a track record which they can then use to acquire more retail customers. The Co-op encourages local producers to participate in-store

sampling events for their products; this gives the producers an opportunity to improve their marketing skills with consumers.

As a consumer grocery cooperative, the Co-op differs from national grocery chains and regional grocery markets because it is owned by its customer/members. Member equity of \$2.0 million accounted for 29 percent of the value of the cooperative's assets and retained earnings totaled \$1.9 million in 2008. Although it is not currently doing so, the Co-op has paid out patronage refunds to members in the past. Also, member households can receive a five percent discount on their purchases for each month that they work (two hours for a one- to two-person household).

As part of the Co-op's commitment to be a leader in the local foodshed, the store makes a special effort to market foods and other products produced within 100 miles from the store. Products that are locally produced have a special local shelf tag. The Co-op's payroll totaled \$4.3 million in 2008 for its 130 employees. Given the employees' concern for sustainability, it is likely that a majority of them live in the local area and spend a significant portion of their earnings locally.

Clearly, the Co-op's spring mix supply chain is part of a much larger diversified agricultural production system, and the economic impacts cannot be attributed solely to the spring mix component.

### Prospects for Expansion

While there is significant interest in local foods among the Co-op's customers and the Co-op has a strong commitment to sourcing produce and other food products from local suppliers, prospects for expansion of the Co-op's sales of locally grown spring mix do not appear to be strong. Barriers to expansion include local growers' high production costs relative to those who machine harvest large plantings of spring mix; this causes the local growers to favor marketing directly to consumers and selling to the Co-op only when they have excess supply of spring mix. Secondly, weather conditions do not favor a consistent supply of high quality product that the Salinas Valley growers can produce from spring through late fall; the area's summer temperatures are generally too hot and fall plantings can be ruined by heat waves as well as heavy rains.

As a major purchaser and seller of certified organic produce, the Co-op has not had any difficulties with USDA's National Organic Program; the Produce Manager asks all of her suppliers to provide their organic certificates annually. California's Department of Food and Agriculture has packaging standards for all produce that is purchased for resale. The Co-op was purchasing from a local grower who was packing produce in nonstandard boxes; it stopped buying from the grower until the grower got new boxes.

The Co-op's produce manager did not express much concern about food safety standards; the Co-op has never been associated with a food safety outbreak related to produce or any other foods. However, Earthbound, its supplier of packaged spring mix salads, was identified as the processor of the contaminated baby spinach that resulted in the highly publicized 2006 *E. coli* O157:H7 outbreak in 2006. Terra Firma's Paul Holmes expressed great concern about food safety regulations for leafy greens. USDA is currently considering enacting a National Leafy Green Marketing Agreement (LGMA) that is modeled after California's LGMA. This voluntary handler program was created in 2007 as a response to the 2006 outbreak; it specifies food safety practices for both handlers and growers of leafy greens. Currently, the Co-op does not require its four local spring mix growers to be compliant with the California LGMA provisions, and none of these growers supply any signatories to California's LGMA.

Holmes indicated that if Terra Firma was required to comply with the National LGMA, it would no longer grow any leafy greens. Recent research indicates that compliance with California's LGMA and other food safety standards approaches \$100/acre, with smaller producers having higher per acre costs than larger producers.<sup>31</sup> Additionally, FDA is initiating efforts currently to develop nationwide food safety standards for all produce.

## Key Lessons

Spring mix is one of the many locally grown produce items sold by the Co-op. However, spring mix sales are very limited because local growers prefer to market most of their product direct to consumers. They earn higher returns by selling spring mix through farmers markets and their CSA programs, although the Co-op is paying them a significantly higher price than Salinas Valley growers are paid by Earthbound and other salad processors. The Co-op is willing to earn lower margins on the locally grown product in order to keep it priced competitively.

The Co-op's produce manager incurs significant transaction costs to source locally grown spring mix. The available supply to the Co-op is erratic during the local season due to both weather conditions and the growers' treatment of the Co-op and other local grocers as a residual market; the Co-op often runs out of product and has to have a back-up supply of "mainstream" product from a distributor. Additionally, she is sometimes requested to raise the retail price for the local spring mix, such that it is on par with the price the growers charge at farmers markets. Nevertheless, she has a strong relationship with the four local growers, due largely to the other vegetables and fruits that these growers sell to the Co-op.

The Co-op is a particularly interesting illustration of the market for locally grown produce because it uses three different supply chains for spring mix in order to have a reliable supply of this delicate and high-volume produce item. Locally grown spring mix only represents one percent of the Co-op's sales (weight-wise). As described above, its availability is limited and consumer demand does not seem to be particularly strong for it. Packaged spring mix comprises one-third of its spring mix sales (weight-wise) and part of the supply chain is the same one examined in the "mainstream" case. Bulk spring mix that is not locally grown is the Co-op's primary spring mix product; it is supplied by a long-time distributor of organic produce that sources it from several smaller processors that operate in both the Salinas Valley and the desert.

## Cross Case Comparisons

The three Sacramento area case studies conducted—Nugget Markets, Fiddler's Green Farm, and Davis Food Co-op—demonstrate the variety of market sources for spring mix available to consumers.

### Supply Chain Structure

We addressed six specific questions about the structure of local food supply chains. For the most part, findings highlight structural differences between the two local food supply chains and the mainstream chain.

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<sup>31</sup> Hardesty, S. and Y. Kusunose. 2009. Growers' Compliance Costs For the Leafy Greens Marketing Agreement and Other Food Safety Programs. Small Farm Program Research Brief. <http://sfp.ucdavis.edu/docs/leafygreens.pdf>, accessed 11/20/09.

*1. Do direct and intermediated food supply chains provide the consumer with detailed information about where, by whom, and how the product was produced?* Consumers receive the most detailed information about where, how, and by whom their spring mix is produced through the direct market local food supply chain; through direct contact with Eldon at the farmers market. Although the Co-op has a well-developed local food program, spring mix is one of the rare produce items that it does not identify local spring mix with individual farm names because it frequently runs out of the local product; instead, the Co-op labels local spring mix as “Local/California”. Spring mix is not part of Nugget’s relatively limited local produce marketing program.

*2. Are durable relationships between supply chain partners – characterized by a high degree of trust, information sharing, and decision sharing over time – important in food supply chains where trading partners exhibit strong mutual interdependence or one partner depends on another in a unique way?* Durable relationships between supply chain partners are evident across all chains. There is significant information exchange and trust between mainstream supply chain members (Nugget and Nor-Cal) and between the intermediated supply chain members (the Co-op and its local grower suppliers). Similarly, in the direct market supply chain, Fiddler’s has loyal customers at the farmers market who trust Eldon to provide them with safe and fresh product.

*3. Are prices in direct and intermediated food supply chains decoupled from prices determined in commodity markets?* The prices charged by Fiddler’s, Terra Firma and other local growers who supply the Co-op in the intermediated supply chain are decoupled from commodity markets. Since mainstream supply chain member Earthbound is the brand leader for organic spring mix (as well as being a major supplier of private label spring mix), we can conclude that Earthbound has major influence on the commodity price of spring mix. Information on prices paid to Earthbound’s growers was not available; however, we surmise that, to ensure steady supplies, they have season-long contracts with Earthbound paying a stable price.

*4. What is the role of collective organizations (such as producer and consumer cooperatives and farmers markets) in direct and intermediated food supply chains?* Collective organizations, particularly farmers markets, have contributed significantly to the success of local supply chains for spring mix. Currently, Fiddler’s is generating 70 percent of its revenues from sales at farmers markets. When the local producers first began marketing their spring mix and other produce, the farmers markets served as a marketplace where they could earn a premium for their organic produce, provided them access to wholesale customers as well as consumers, and created the initial customer base for their CSA programs. Although consumer grocery cooperatives serve as important intermediaries in the marketing of local produce, their role in marketing spring mix has been limited due to the higher prices earned by producers in direct market channels.

*5. Does the presence of a strong industry that distributes nationally or internationally help create an infrastructure of knowledge and services that facilitates the development of direct and intermediated food supply chains?* Fiddler’s and the other local spring mix growers who market through direct and intermediated supply chains are not linked to the national industry infrastructure that is based only 175 miles away. The production and handling methods of the local growers are vastly different from those of the larger and more specialized producers in the Salinas Valley.

*6. Does the presence of local food supply chains for other products and broader local food initiatives help create an infrastructure of knowledge and services that facilitates the development of successful other direct and/or intermediated food supply chains?* Local spring mix producers have benefited significantly

from the strong local food infrastructure provided by the farmers markets, consumer grocery cooperatives, and CSAs in the Sacramento area. As noted previously, direct market supply chain leader, Eldon, developed new restaurant customers through contacts at the Davis Farmers Market, and both he and Terra Firma gain significant transportation efficiencies by being able to combine deliveries to multiple local customers within a single trip.

## Supply Chain Size and Growth

Case study findings provide information related to five specific questions about supply chain size and growth.

*1. What is the portion of total demand in a general product category represented by products sold in direct and intermediated food supply chains? Size differences among these supply chains are noticeable. Fiddler's markets about 2,000 pounds of spring mix annually, while the Co-op's volume totals approximately 8,800 pounds with only 100 pounds of local product. By contrast, Nugget's spring mix sales in the mainstream supply chain average approximately 6,500 pounds per store annually, and none of it is local.*

*2. Do problems with access to and costs associated with processing and distribution services limit the size of direct and intermediated food supply chains and raise product costs to the point where it is difficult to compete with products in mainstream food supply chains? Access to processing and distribution is not a significant barrier to expansion for Fiddler's or the other local growers supplying the Co-op. However, Earthbound does benefit from significant scale economies associated with its mechanized harvesting and processing.*

*3. Do fixed costs for compliance with regulatory and operating standards (public or private) limit the ability of low-volume local food products to enter mainstream supply chains? Fixed costs for compliance with regulatory and operating standards limit the potential size of the chains. Following recent outbreaks of food-borne illness, food safety operating standards have been broadly adopted by leafy greens handlers supplying mainstream markets; thus far, their impact on the smaller local producers has been negligible because these growers have not sought distribution in these markets. However, the FDA has issued a draft guidance document for leafy greens; if these good agricultural practices standards became regulations, high compliance costs could make spring mix production unprofitable for small growers in local supply chains.<sup>32</sup>*

*4. Does lack of year round availability limit market opportunities for local food products? Lack of year round availability limits market opportunities for local spring mix. Although spring mix was available at the Davis Farmers Market during 48 of the 49 weeks when we collected data for this project, supplies were limited during half of the year. This limited availability creates a thin market with high prices for local spring mix, and restricts supplies in the intermediated supply chain where wholesale prices of non-local spring mix are significantly lower.*

*5. Do direct and intermediated food supply chains respond to growth opportunities through replication of firms or through internal expansion? Expansion opportunities are mixed across the supply chains. For example, in the direct market supply chain, expansion is likely to come through entry of new growers at farmers markets. However, growth in the intermediated supply chain is unlikely because local growers earn higher prices by direct marketing their spring mix.*

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<sup>32</sup> Hardesty and Kusunose, op. cit.

## Supply Chain Performance

We examine five specific questions about how direct market and intermediated supply chain performance compares with the performance of mainstream chains.

1. After subtracting marketing costs, do producers receive higher per unit revenue and retain a greater share of the price paid by the final consumer in direct and intermediated food supply chains? Allocation of retail revenue for spring mix varies widely across the three supply chains. Many growers are attracted to farmers markets because they can sell their produce at retail prices, or even earn a premium over the regular retail price. When adjusted for marketing costs, the producer's share of revenues decreases with distance to market and the number of intermediaries involved in the supply chain (table 9). Fiddler's costs for marketing at the farmers market represent an estimated 26 percent of the revenues he generates. Eldon incurs marketing expenses selling at farmers markets, such as transportation costs, farmers market stall fees and labor costs for driving to and from the market, and setting up

**Table 9. Allocation of Retail Revenue in Sacramento, CA – Spring Mix Chains, by Supply Chain and Segment**

Supply chain segment	Mainstream		Direct		Intermediated	
	Nugget Market Revenue (\$/lb)	% of total	Fiddler's Green Revenue (\$/lb)	% of total	Davis Food Co-op Revenue (\$/lb)	% of total
Producer <sup>1</sup>	0.79	12.2	5.92	74.0	3.00	50.1
Producer estimated marketing costs <sup>2</sup>	0.02	0.30	2.08	26.0	0.75	12.5
Processor	1.16	17.9	-	-	-	-
Distributor <sup>3</sup>	0.77	11.9	-	-	-	-
Retail stores	3.75	57.8	-	-	2.24	37.4
Total retail value <sup>4</sup>	6.49	100	8.00	100	5.99	100

Notes:

- indicates "not applicable." For the direct and intermediated supply chains, the farm also operates as the processor

<sup>1</sup> Mainstream: Calculated as a weighted average of farmgate prices paid in Monterey and Imperial counties, 60 percent and 40 percent, respectively, and adjusted for 45 percent of the production in each county earning a 10 percent price premium for organic product. Direct and Intermediated: Includes compensation for processing activities, such as washing, mixing, and bagging.

Calculated as a weighted average of farmgate prices paid in Monterey and Imperial counties, 60 percent and 40 percent, respectively, and adjusted for 45 percent of the production in each county earning a 10 percent price premium for organic product.

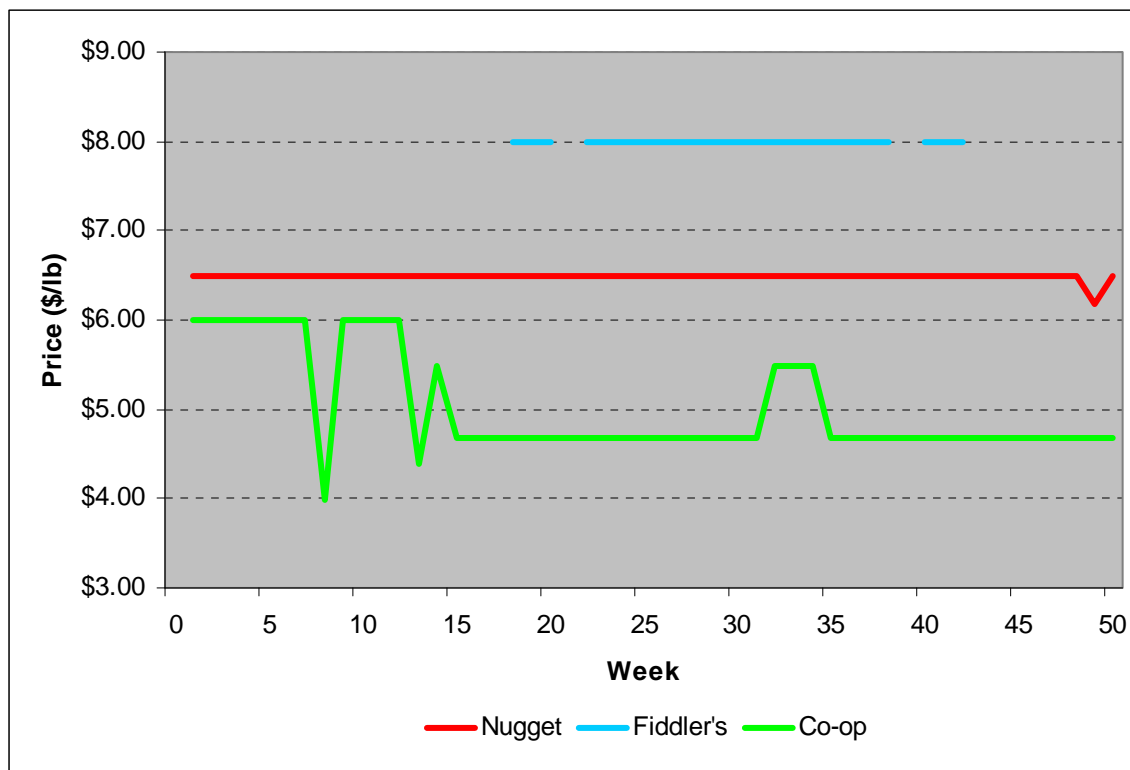
<sup>2</sup> Mainstream: Includes estimated costs of transportation to the processor. Total farm per unit revenue is  $0.79+0.02 = 0.81$  (\$/lb). Direct: Includes estimated transportation costs, farmers market stall fees, and opportunity costs of time for marketing activities. Total farm per unit revenue is  $5.92+2.08 = 8.00$  (\$/lb). Intermediated: Includes estimated transportation and packaging costs. Total farm per unit revenue is  $3.00+0.75 = 3.75$  (\$/lb).

<sup>3</sup> Includes compensation for inbound freight charges averaging \$0.50/pound for bulk spring mix.

<sup>4</sup> Mainstream and Direct: Median retail price of bulk spring mix from January to December, 2009. Intermediated: Median retail price of bulk spring mix from January through March, 2009.

their stall, staffing it and taking it down. Even if Eldon is doing this himself rather than hiring someone, he is incurring opportunity costs for his time. Nevertheless, selling at the farmers markets also gives him the opportunity to talk to current and potential customers--to gain better understanding their needs and get their feedback about his produce, and potentially developing new restaurant customers.

2. *Is differentiation by quality attributes other than "local" that require extra efforts or unique capabilities necessary to receive and sustain price premiums for local food products?* Observed weekly prices for spring mix for each of the three supply chains are shown in figure 6. These were collected through weekly visits to two supermarkets, two natural food stores, and two farmers markets. Earthbound's spring mix is sold year-round at Nugget and occasionally at the Co-op. Spring mix at the farmers market clearly earns a significant premium – Fiddler's \$8/lb. price is 71 percent higher than the Co-op's \$4.69 median price, and 23 percent higher than Nugget's consistent \$6.49 price.



**Figure 6. Weekly Prices for Bulk Spring Mix**

3. *Does concentration of costs for employee and proprietor labor inputs in farm and processor segments of direct and intermediated food supply chains result in a larger contribution of wage and business proprietor income to local economies?* Revenue retention within the local economy appears to be relatively high in all three supply chains. Fiddler's owner, Eldon, and the other local spring mix growers and Fiddler employees, live locally and presumably spend most of their household earnings in the Sacramento area. The Co-op has approximately 130 full time and part-time employees with payroll expenses totaling \$4.3 million in 2008; given the Co-op's high levels of community support and environmental awareness (including riding bicycles to work), it is highly likely that all of the Co-op's employees live in the Sacramento area. In Nugget's case, the company is owned by a local family and ten of its twelve stores are in the Sacramento area. Nugget hires approximately 1,500 employees, 60 percent of whom are full-time; its payroll totals approximately \$40 million. Additionally, Nor-Cal is owned by a local family; it has 140 employees and a payroll of approximately \$6 million. It is highly likely that most of Nugget's and Nor-Cal's employees live in the Sacramento area.

4. *Does a typical unit of product in direct and intermediated food supply chains travel fewer miles and use less fuel for transportation per unit of product sold?* Clearly, spring mix travels fewer miles in the direct and intermediated supply chains. However fuel use results are mixed when factoring in transportation loads, demonstrating how product aggregation can provide fuel efficiency in local food chains (table 10). Fuel use per 100 pounds of product is clearly the lowest in the Co-op's local supply chain; the shorter transport distances offset the inefficiencies of transporting products in smaller loads more than the full semi-trailer loads used in Nugget's mainstream supply chain. However, Fiddler's loads in the direct market supply chain are so small that it has the highest fuel use despite having the shortest transport distance and the highest fuel efficiency.

5. *Do direct and intermediated food supply chains foster the creation of social capital and civic engagement in the consumption area?* All three chains are involved in community building efforts. Eldon donates his unsold produce to food banks and serves on the board of the Davis Farmers Market. Nugget has a generous local support program that includes various agricultural organizations, and its management coaches entrepreneurship students from the local universities. Overall, the Co-op appears to have the most extensive community support program; it is involved with both food-related causes such as educating local school children about whole grains and eating seasonally and the annual Holiday Meal, as well as donating to various charities.

**Table 10. Food Miles and Fuel Use in Sacramento, CA – Spring Mix Supply Chains**

<b>Supply Chain Segment</b>	<b>Food Miles</b>	<b>Truck Miles</b>	<b>Retail Weight (cwt)</b>	<b>Fuel Use (gal)</b>	<b>Fuel Use per cwt shipped</b>
Mainstream: Nugget Market (CA)					
Producer to Processor-Shipper <sup>1</sup>	30	60	130	10.0	0.08
Processor-Shipper to Distribution <sup>2</sup>	192	372	400	67.6	0.17
Distribution to Retail <sup>3</sup>	16	150	250	25.0	0.10
All Segments	238				0.35
Mainstream: Nugget Market (AZ)					
Producer to Processor-Shipper <sup>1</sup>	45	90	130	15.0	0.12
Processor-Shipper to Distribution <sup>2</sup>	618	1250	400	227.3	0.57
Distribution to Retail <sup>3</sup>	16	150	250	25.0	0.10
All Segments	679				0.79
Mainstream: Nugget Market (CA & AZ combined)					
All Segments <sup>4</sup>	414				0.52
Direct: Fiddler's Green					
Producer to Retail <sup>5</sup>	35	105	14.0	8.8	0.63
All Segments	35		14.0		0.63
Intermediated: Davis Food Co-op					
Producer to Co-op <sup>6</sup>	22	95	60.0	10.5	0.18
All Segments	22				0.18

Notes:

<sup>1</sup> These short-haul loads use a trailer that achieves fuel economy of 6 mpg.

<sup>2</sup> These loads are transported in a tractor-trailer that achieves fuel economy of 5.5 mpg.

<sup>3</sup> These loads are transported in a tractor-trailer that achieves fuel economy of 6 mpg.

<sup>4</sup> Food miles and fuel use per cwt are calculated as the average of the CA and AZ chains, weighted by the total product weight in each chain (60% for CA, 40% for AZ).

<sup>5</sup> All transport in this chain is in a box truck that achieves fuel economy of 12 mpg.

<sup>6</sup> All transport in this chain is in a refrigerated box van truck that achieves fuel economy of 10 mpg.

Source: Author's calculations based on case interviews.

## Key Lessons

Three general lessons emerge from these case studies of spring mix supply chains in the Sacramento area.

1. Despite the strong potential that intermediated supply chains offer conceptually, it is highly unlikely that this structure will expand sales of local spring mix. While growers have durable relationships with the local natural foods cooperative, they view the cooperative as a residual market for their excess supply because they earn higher returns from marketing their spring mix at farmers markets and through their CSA programs. Thus, local spring mix growers are capturing significant premiums through their direct marketing efforts, which the Co-op, Nugget and other retailers cannot pay when nonlocal spring mix is available at a much lower cost.
2. Related to the previous lesson is the fact that the mainstream supply chain is providing formidable competition in the spring mix market. Earthbound has been largely responsible for building the nation's spring mix market over the past 25 years; it started as a niche marketer and has now become a highly competitive nationwide supplier of an organic commodity. Unlike local growers, Earthbound manages production in two growing regions to be a highly reliable year-round supplier of organically grown leafy greens and gains substantial scale economies by using highly mechanized harvesting and processing technologies.
3. There are several cross-linkages between entities across the supply chains. The distributor for the Nugget Markets, Nor-Cal, is also one of the Co-op's distributors. While Terra Firma is a spring mix supplier to the Co-op, it also markets some of its produce (but not spring mix) through Nor-Cal. Fiddler's, the direct marketer, is also a spring mix supplier to the Co-op. This crossing of boundaries across the supply chains indicates that the involved entities are using entrepreneurial flexibility to take advantage of opportunities created by demand for locally produced foods.