

5-2015

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The Future of Shrimp: Why Indoor Tank Farming Could Revolutionize the Industry

By:

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**An Honors Thesis in partial fulfillment of the requirements for the degree Bachelor of
Science in Business Administration**

Sam M. Walton College of Business

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Fayetteville, Arkansas

April 6, 2015

Introduction

“The United States is currently importing 1.2 billion pounds of shrimp a year from Asia. It is cheap to U.S. consumers, but it’s being produced in an unsustainable way. It will stop...and when it does stop there has to be an alternative way to produce seafood” (Hourigan, 2013, p.1). Because the shrimp supply crisis is growing exponentially, it is the job of countries like the United States, who have resources and technology that less economically developed countries do not, to find a sustainable alternative to the current destructive farming practices that are rapidly damaging ecosystems and endangering human health. In order to pursue this goal of an alternative shrimp farming practice, this paper will seek to provide answers to the problem through research, with particular interest in a new method of growing shrimp that uses indoor tanks and recirculating water to make a zero waste operation that produces domestic, healthy, and safe shrimp in the United States, specifically the Midwest. This research will examine environmental concerns of current shrimp production, health concerns with imported shrimp, global and domestic consumption rates, and recent technology developments. At the conclusion of this research, a business plan for a low resource farmer looking to begin an indoor shrimp farm in Kansas, USA will be provided.

I. Environmental Concerns with Current Shrimp Production

The methods of shrimp farming that are currently prevalent in the US are raising concerns because of the negative environmental impact. Coastal shrimp farmers clear an extensive amount of mangrove forests to run their businesses. In fact, coastal shrimp farming accounts for 38% of global mangrove loss, and if left unmitigated, “mangrove forests may at least functionally disappear in as little as 100 years” (Polidoro et al., 2010, p.2). Mangroves provide a necessary habitat for marine and terrestrial species, protect coastal human populations

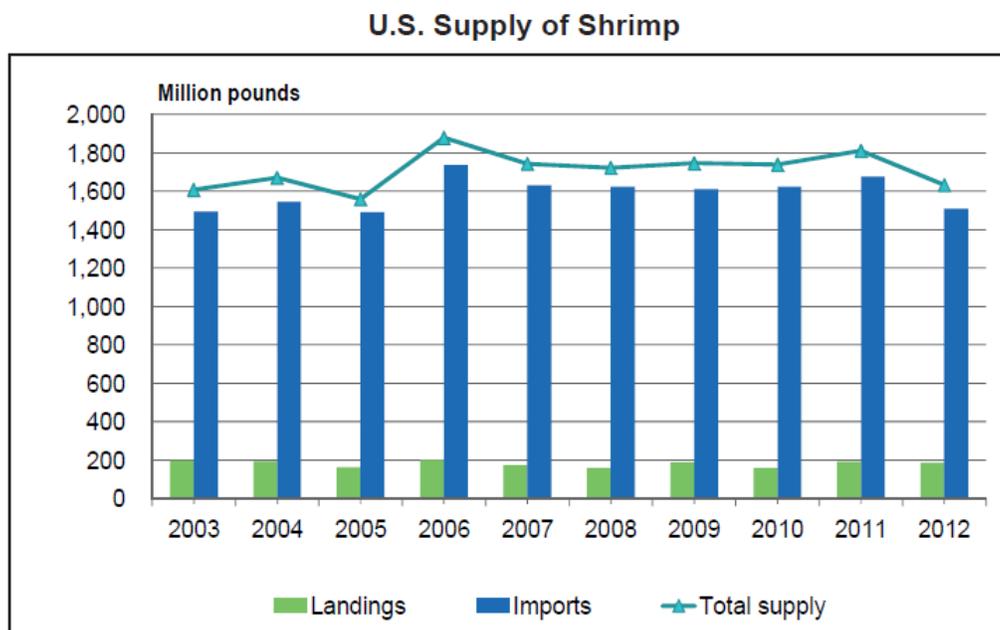
from erosion and tropical storms, and maintain the balance of nutrients and sediments in coral reefs and seagrass beds. Loss of mangrove forests along coastlines has had significant effects on coastal communities, along with a loss of wildlife species that rely on mangrove forests to shelter them. The world was not planning on the rapid and unprecedented growth that the shrimp industry experienced from the end of the 1980's and into the early 1990's (Béné, 2005), and it resulted in the coastlines of countries becoming riddled with an influx of shrimp farmers that are more concerned with profits than the environment. The problems they brought with them were immense and also relatively ignored: the biological pollution, fish captured for fish feed, organic pollution, chemical pollution (such as antibiotics haphazardly added to ocean waters), and habitat modification (Goldburg, Elliott, & Naylor, 2001).

A troubling statistic from a study performed in 2010 estimated that across the globe, “between 20% and 35% of mangrove area has been lost since approximately 1980... and mangrove areas are disappearing at the rate of approximately 1% per year” (Polidoro et al., 2010, p.2). Not only is the habitat taking a toll, the supply of shrimp in the ocean is decreasing rapidly. Hollywood adequately portrays the dwindling shrimp industry when Forrest Gump tries to enter the shrimping business and while Forrest Gump is fiction, it is an accurate description of the overfished oceans in the present day. The United Nations' Food and Agriculture Organization (FAO) warned that the “shrimp stocks in the Pacific, Atlantic, and Indian Ocean [are] depleted, overexploited, or fully exploited” (Gunther, 2012, p.2). The oceans are no longer a reliable place to go for our shrimp; we need a sustainable solution that results in minimal damage to the ecosystem and surrounding communities.

II. Health Concerns Related to Imported Shrimp

The United States has strict requirements, inspections, and guidelines for domestic food producers and distributors. This does not always apply to foreign imports; however, according to Stonich and Bailey (2000), “99 percent of cultured shrimp are raised in the third world...and virtually all are exported to industrial countries” (p.24). Figure 1 below is a chart demonstrating the imbalance between US imports and domestic production:

Figure 1: US Supply of Shrimp



*Retrieved from the *Supply of Fishery Products*.

*Landings are domestic farms that either grow farmed shrimp or catch wild shrimp

Of these imports, only a small amount of shrimp is tested when it enters the United States, which leaves a strong chance that diseases and chemical contamination can occur. The US has restrictions on antibiotics, growth hormones, and pest controls that the majority of other countries do not regulate (Jacobson, 2008). Also, it is not just production flaws that Americans must be aware of. The shrimp – which are almost always transported in a frozen state—must be kept adequately chilled or in sealed containers (*Food and Water Watch*, 2009). Another problem

for shrimp farmers utilizing massive outdoor ponds or wild-caught shrimp is the prevalence of disease. The World Bank “estimates that about \$3 billion worth of shrimp is lost each year to disease” (*Food and Water Watch*, 2009, p.2). Diseases in the ponds are so difficult to control that it can wipe out an entire farm with just one cycle of shrimp. Due to the nature of the indoor method in individual tanks, the risk of disease is infinitely lower, and easily contained if it somehow makes it into the tanks. The bottom line is that shrimp grown in America is held to higher standards than imported shrimp; domestic farming removes the guessing game of where the shrimp came from and the conditions in which it was grown.

III. Global and Domestic Consumption Rates

From 2004-2014, global per capita shrimp consumption has increased by 200% (Wirth, 2014), which has led some experts to believe that aquaculture is the fastest-growing segment of US agriculture (Goldburg et al., 2001). This growing demand must be matched by a reliable supply. There is a large supply of frozen, foreign shrimp, but fresh shrimp is lacking, as demonstrated by the Figure 1 above. As the organic and health trends take effect in the US, the nutrient-dense and low calorie shrimp is growing in popularity. Farming shrimp in the US is a lucrative business, “grossing more than \$7 billion annually, one-sixth of all aquaculture trade” (Béné, 2005, p. 585). Brandon Tidwell, a sustainability manager for Darden, predicts that “as the human population soars this century...the demand for seafood is going to grow exponentially” (Gunther, 2012, p. 4). The facts are clear: the demand for shrimp should be present for a significant amount of time, so the supply needs to increase as well.

IV. Recent Technology Developments

Existing research about new methods of shrimp farming, specifically in regards to tank farming, is lacking; for instance, the research contained either complicated write-ups on experimental shrimp tank designs or simply discussions on the problems with shoreline shrimping. The industry is simply so new that the “best” method of indoor shrimping hasn’t really been tested and proven yet. In fact, in March of 2014, NaturalShrimp announced that they will be constructing “the first large scale shrimp facility in North America” (*PR Newswire*, 2014) (*PR Newswire*, 2014, p.1). Its system “uses proprietary technology to reliably produce healthy, naturally-grown shrimp without the use of antibiotics or toxic chemicals” (2014). One of the goals of this report is to prompt an expansion of the industry, which automatically will lead to more research and development. If America can come up with a simple farming method that is profitable for the investors, the methods could be taken overseas to improve their methods as well. This technology “could help tackle malnourishment while reducing environmental degradation, and all at lower cost than current shrimp production” (Dobrovonly, 2014, p.1).

Hypothetical Business Plan for Sunflower Shrimp

New Business beginning July 1, 2015

I. Executive Summary

Sunflower Shrimp is a business that has come forth in response to the growing demand for fresh, high quality shrimp in geographic areas far from an ocean. There are no options for non-frozen shrimp in Sunflower Shrimp's target market. High initial capital investment and a lack of research in this type of shrimping limit the ability of farmers to invest in an indoor tanking operation.

Sunflower Shrimp will advertise their shrimp as a clean, reliable product with no added chemicals, grown in a sustainable, minimal-waste system. This product will appeal to affluent, health-conscious individuals, as well as restaurants and grocery stores looking to offer a safe, unique product to their consumers. The reach of marketing will come mainly from word of mouth, as well as efforts from social media, emails, and of course, publicity.

The shrimp itself will be grown in eight tanks, called grow-outs, and the shrimp will transfer among tanks as they mature. The span from delivery of the shrimp fry until they can be sold is roughly 4 months. Sunflower Shrimp is aiming to sell 18-22 count per lb, and at \$15 per lb. This is much higher than imported frozen shrimp costs, but they will be larger and clearly fresher than shrimp from India or Vietnam.

The financial investment will be \$180,000, with \$106,000 of that total being provided by loans. After year 2, the business will hit the breakeven point, and from there the profits rise quickly. The owners are patient, thorough, and consistent, so the operation is in good hands. As long as operations are continually improved, this will be a lucrative business.

II. Market Analysis

The shrimp industry has been establishing itself since the beginning of the 1900's, with interest and momentum beginning in the late 1980's and the early 1990's. The existing methods of shrimping include open sea fishing, coastline farms, inland ponds, and the newest of which is growing shrimp indoors in tanks. This new development has come around as a result of the need of a sustainable alternative to all existing methods of producing shrimp. Diseases, pollution, shortages, and the environmental footprint have given these methods a short life expectancy. Experts predict that while global seafood consumption increases, "harvests from natural fish stocks will probably remain static or decline... and nearly all of the [global demand] increase must come from aquaculture" (Diana, 2009, p.28). In fact, in 1999 the U.S. Department of Commerce (DOC) called for a five times increase in the United States aquaculture production by the year 2025 (Goldburg et al., 2001).

Though this suggested increase encompasses all forms of aquaculture, shrimp farming makes up one-sixth of aquaculture trade in the US (Béné, 2005). The outlook for the domestic industry is overwhelmingly positive, and entering an industry using a method that will soon become absolutely necessary for shrimp production leaves less risk on this production operation, Sunflower Shrimp. Specific to the type of farming Sunflower Shrimp will do, there is an even brighter outlook on the industry. Karlanea Brown, VP of operations for RDM Aquaculture which has been established since 2009, says that "restaurants are putting in requests for as much as 300 pounds of shrimp per day, far more than the nascent Midwestern aquaculture industry can provide" (Rotenberk, 2013, p.4). The small, yet growing, number of indoor shrimp farms cannot yet produce enough shrimp to meet the demands.

Target Market.

Sunflower Shrimp will be targeting individuals aged 40-75. Due to geographical location, the most likely consumer will be those around retirement age, who have health at the forefront of their minds and who also have the means to buy quality shrimp. According to Consumers 19 Shrimp Purchasing Preferences in 2014, after administering a survey to 5,000 participants, they found that “the heaviest consumers of shrimp tend to be well-educated, affluent adults in the 35-55 age range” and they are not primarily Caucasian (Wirth, 2014, p.184). Though Sunflower Shrimp’s target market is slightly above this age range, it is also offering a premium product that is selling above the price of supermarket shrimp. The consumers will need to have more discretionary income to use on higher quality shrimp.

Another demographic group that will be targeted is the environmentally conscious consumers who will appreciate a sustainable option. These would be people who would prefer to shop at a farmer’s market, who value local and organic and who are skeptical of processed foods. According to *Food and Water Watch*, “increasingly conscious consumers are searching for shrimp with fewer negative impacts on their health, the environment and indigenous communities” and even companies such as Red Lobster are going to “partake in environmentally responsible sourcing of shrimp” (*Food and Water Watch*, 2009, p.9).

Sunflower Shrimp will attempt to develop a relationship with chefs from local restaurants too. Though initially this shrimp operation will not have enough production to supply an entire restaurant, it is a future goal. Chefs will be drawn in by the look of the head-on shrimp, which is more visually appealing to use in dishes. Peter Howard, a 40-year old veteran says top Boston chefs prefer to cook whole shrimp instead of the more common imported product that is headless

and frozen (Wood, 2013). For testimonies of chef's who have tried this product grown in indoor tanks, please reference section IV, Product Line Strategy.

Market Trends.

As stated prior to the business plan, shrimp consumption is increasing at a rapid rate. In the United States, the “projected per-person increase in consumption should lead to a total increase of 1.5 million to 2 million metric tons by 2020” (Diana, 2009, p.28). This growth is good for companies like Sunflower Shrimp looking to enter the market. Shrimp is also the “most consumed seafood species in the United States” (Wood, 2013, p.2), indicating that Americans support this industry. Currently there are no indoor fresh shrimp farms in the middle of the country, especially not in Kansas. The business is growing in the upper Midwest, stemming from the expansion of a few bigger farms in Indiana. Consumers don't currently have an option for shrimp like Sunflower Shrimp, so this is an excellent chance to fill an unmet need.

Purchase Behavior.

Purchasing of shrimp across the entire United States population is still not extremely frequent, despite it being the most purchased seafood. It is estimated that Americans eat 4 pounds of shrimp per person per year (Gunther, 2012), with the majority of that being the frozen, imported kind of shrimp.

How to Gain Market Share.

Geographically, Sunflower Shrimp will have sole ownership of the market share. There are no competitors within a reasonable distance or delivery time frame. If new companies were to enter the Kansas area – which is likely due to the strong theme of agriculture in Kansas – then Sunflower Shrimp will still have the first mover advantage, and will have hopefully have already established a loyal customer base.

Pricing.

For an operation that sells the same shrimp as Sunflower Shrimp that is produced using the same methods, prices typically range from \$15-\$20 per pound. The larger the shrimp (i.e. the fewer shrimp per pound) will almost always sell at a higher price due to a longer grow-out phase. Sunflower Shrimp will sell 18-22 count shrimp, which classifies these shrimp as “jumbo.” Sunflower Shrimp will charge \$15 per pound, so the shrimp will be sold at a premium. The similar operations that have provided details to Sunflower Shrimp have never had a lack of demand, so the business is confident that \$15 per pound will not deter the majority of customers from making a purchase.

Resources for Finding Information about Consumers.

Finding data about customers will come mainly from market reports and Sunflower Shrimp’s own observations. To build a network, they plan on collecting information from customers to join an email list, as well as to gain geographical data about how far the awareness of Sunflower Shrimp is reaching. Demographical information, such as income and age, collected from nearby cities will be useful to see if there is an untapped market that Sunflower Shrimp has not entered.

Media to Target Customers.

Sunflower Shrimp’s media used to target customers will consist of:

Word of Mouth

Word of mouth is critical in Sunflower Shrimp’s advertising, especially since the business will be located in a small town. Kansas is a state where people talk, and with this being such a novel and ironic operation, word will hopefully spread quickly. There is even a successful shrimp operation in Massachusetts called Sky 8 that doesn’t even have a business sign; it just has

a small, round logo on a side door of their building that depicts a shrimp (Arenberg, 2013).

Interest in its business is from people talking about it, and Sunflower Shrimp has a goal to create as much buzz about this operation as possible. Early on, the company will start to establish relationships with local restaurants and grocery stores. Though these will not be potential clients until the production of shrimp becomes large enough, laying the foundation will make the business relationship easier in the future.

Newspaper Advertisements

Every company has success company has success when they are interviewed through local news stations or papers, because this is something that gets people talking. While this is a novel idea, it is one that appeals to small town news sources because a new business is exciting news. In an interview with Northern Iowa Shrimp farm owner Matt Weichers, he said that “it’s such a big deal raising shrimp here in Iowa that the newspaper did a real nice story and immediately I sold out of everything... we’ve been able to sell out of everything we’ve grown before my next batch is ready” (Fiorillo, 2014, p.2). Through the word of mouth mentioned previously, Sunflower Shrimp will build a customer base to ensure adequate demand at all times of year.

Company Website

The company website will contain all of the information that customers could hope for. It will have a description/pictures of the facilities and the product, it will describe the daily operations, pricing information, location, contact details, customer reviews, and a history of the business and how it started, as well as providing recipes for shrimp preparation. The website will be aesthetically appealing, easy to use, and extremely professional, to reassure customers that Sunflower Shrimp takes pride in its product.

Social Media

Facebook will be critical for updating customers about the availability of shrimp. Many times, there will a gap in the production schedule where the growing shrimp have not reached market size. Sunflower Shrimp wants to be perceived as reliable, and for customers with long commutes, up to date information is necessary.

Instagram will be an easy way of giving customers a first-hand look at daily operations. Part of the appeal of this product is that consumers know where there food is coming from. Taking photos of the shrimp as they grow and of the processes used every day will reassure customers and help gain trust and brand equity.

Emails

Since many Americans get an excess of emails, this will be used on a less frequent basis, mainly to notify customers when a new shrimp harvest is ready or when the business is out of shrimp. This will connect with the older people who do not use social media, or those busy middle-aged customers who do not frequently check Facebook.

Competitor Analysis.

Main Competitors

Most of the aquaculture facilities in the United States tend to be small companies (Goldburg et al., 2001) which is consistent with the dynamics of the indoor shrimp industry. There are a few main competitors who are driving the growth of this new shrimp segment of aquaculture:

Marvesta Shrimp Farms: Beginning in Maryland in 2003, Marvesta was one of the first to enter the industry, struggling for more than 2 years to develop the ideal growing conditions to keep their shrimp alive. They are the true innovators of the industry, and their initial

capitalization of the market has paid off. Marvesta is thriving, with aggressive expansion plans in the future. In 2013, they announced a partnership with RDM Aquaculture, in which the two businesses help new farmers begin shrimp farms, and the farmers in turn supply shrimp for Marvesta's many restaurant contracts (Wolinsky, 2014). The last known production number was from 2008, when they had aggressive expansion planned that would allow them to produce 120,000 pounds of shrimp per year (Jacobson, 2008). At that time, they were supplying directly to consumers who showed up at the door. But now, they have closed-off their operations and deliver directly to consumers, including restaurants. In 2008, restaurants were paying anywhere from \$8-\$16 per pound depending on shrimp size, plus shipping costs (Jacobson, 2008).

RDM Aquaculture: RDM Aquaculture began in 2009, and it has a large operation in Fowler, Indiana, population of 2,200. RDM only produces about 3,600 pounds of shrimp per year at \$15 per pound, but its business isn't driven from grown shrimp sales. Its true profits come from selling pL's (baby shrimp) to operations such as Sunflower Shrimp who are not advanced enough to operate a nursery yet. RDM also offers consulting for the first 12 months of an operation, which includes ordering the correct equipment, helping with set-up, daily water testing, and delivery of the pL's. Since the beginning of its business, it has helped start more than 22 farms (Wolinsky, 2014), ranging from Indiana to an account in Switzerland and Egypt. One notable feature of its operation is that it has a 90% survival rate, which is the best in the business.

Because of its widespread reputation and its superb consulting services, Sunflower Shrimp has decided to invest in RDM's help. Sunflower Shrimp will retain RDM on a fee basis to help get the business started smoothly, as well as help to reduce the risk of failure. The first 12 months will be a huge learning curve, and Sunflower Shrimp can avoid the struggles that other companies have had, such as mass shrimp losses and unproductive practices. Getting the correct

water levels, temperatures, and pH is complicated, as is the transfers between tanks and the feeding regime.

Sky 8: Located in Massachusetts, this is a productive facility that has made some incredible innovations. Since their induction in 2012, they have constantly focused on research and development. They are working on developing an alternative to fish meal, as well as trying to improve productivity. Sky 8 has four main employees, one of which has family in Vietnam who run an unsustainable farm. He has the experience and drive necessary to improve the methods currently used by the indoor shrimp farming industry (Wood, 2013). Sky 8 ships roughly 15,600 pounds of shrimp annually to high-end customers at \$15 per pound (Tabuchi, 2014).

The University of Missouri: The only farm that is geographically close to Sunflower Shrimp is a research facility at the University of Missouri. There, Professor David Brune has begun researching methods of indoor shrimp farming (Vance, 2014). Brune's system is designed to produce 25,000 to 30,000 pounds of shrimp per acre per year, though in 2013 he was only operating about 1/15th of an acre (Hourigan, 2013). Though his facility is not nearly the size of the other three competitor operations, it is the closest operation to Kansas. One interesting aspect of his operation is his pricing: as of 2013, he only planned on selling his shrimp for \$4 of \$5 per pound.

Indirect Competitors: Of course, the shrimp industry as a whole has many competitors outside of SS's niche market. As a small-scale operation, Sunflower Shrimp is competing against foreign imports – which have the advantage of economies of scale, cheaper labor, chemical additives prohibited in the US, and already established shares of the market. Foreign competitors

will always be more visible than a farm like Sunflower Shrimp, since their products are the majority of seafood in supermarkets and local grocery stores.

Weaknesses of the Competition.

The direct competitors of Sunflower Shrimp, those dealing specifically in indoor shrimping, have some weaknesses that could prove to be a disadvantage for them in the near future.

The main problem those competitors face is oversaturation of the Indiana/Northeastern US market: since companies like RDM and Marvesta have been so intent on expanding the industry, there is now an abundance of shrimp operations in the mid-northeast section of the country. This is not a problem for anyone yet, but as more companies enter that same geographical market, it could result in a decreasing rate of demand growth.

Many of these businesses are run by former agriculture farmers, who did not need to necessarily market and sell their product. A commodity like wheat or corn can always sell, without necessarily needing to establish a reputation or a brand name for itself. A lack of focus on the customer relations side could harm businesses if the market gets large enough for consumers to have more than one viable source for their fresh shrimp.

A third weakness that the bigger companies could soon face is the commoditization of their shrimp. At the scale they are reaching, wholesaling is the next step. At that point, they lose the competitive advantage of being a transparent source of shrimp and a small town, family run business. It loses the charm of what a special product this is that local farmers are producing. They will also have to compete almost directly with the foreign imports, due to the size of their productions. Though these larger companies have done well at navigating their expansion thus far, it is a risk that could cause major problems for them.

Barriers to Entry.

There are some significant barriers to entry into this specialized industry. It is so new that there are few guidebooks or instructions on how to jump in to the market.

Possibly the biggest barrier to entry is the high initial capital investment. According to the journal *Food and Water Watch*, these operations are “still an anomaly in the industry, in large part because they require more start-up capital and do not generate immediate profit” (2009, p.1). Sunflower Shrimp is okay with waiting for a Return on Investment, because they have a detailed long-term financial plan, which is outlined in the Financials section at the end of this document.

There is limited research on specific methods that do and do not work. There are no proven studies about the profitability or efficiency of one method of indoor shrimping over the other, which can make it difficult to want to invest in a risk like that.

A lack of knowledge of the science and lab techniques necessary to raise shrimp, as well as a lack of product knowledge, can greatly increase the risk of failure.

Existing Patents Related to Indoor Shrimping.

Texas A&M is so far the only entity that has patented its indoor shrimp farm design. Texas A&M created a vertical raceway type system that has been patented to expand into mass production (Samocha, 2012). This will only restrict the largest of companies who will now have to create different systems of production. This should have a minimal impact on Sunflower Shrimp’s design and operations.

III. Marketing Strategy

Market Penetration Strategy.

The best way for Sunflower Shrimp to penetrate the market is by spreading awareness and understanding of its product and methods of production. There is a strong pull for reliability, and since this product is not available in Kansas markets, a clear description of the benefits will be necessary. Consumers must understand the value of a small, family-run business that provides a healthy alternative to unsafe shrimp.

Strategies for Growth.

Sunflower Shrimp will lean heavily on social media to grow interest in the company and the product. The management must present itself as reliable, consistently updating customers on the status on the shrimp stocks, as well as constantly developing a long-term relationship with each customer who comes through the door. The limited supply at the beginning will help drive demand, because the product will only be available at certain times.

The future expansion plans are steady, with the goal being to add one additional building each year. The operations will need to continually get more efficient, the marketing will need to reach more potential customers each year, and R&D will become a huge part of the strategy once enough profit has been built up to sustain costs associated with R&D.

Distribution Channel Strategy.

Initially, Sunflower Shrimp will rely on people coming directly to the farm to purchase shrimp. That alone has sustained certain other competitor operations for 5+ years. But when Sunflower Shrimp gets a large enough supply, the next step would be to make short-distance deliveries directly to the consumers. Short deliveries will require an insulated tank on a truck, which would require additional investment and experimentation on transportation timelines and

survival rates of the shrimp. Delivery would allow Sunflower Shrimp to target seasonal farmer's markets, which would be an easy way to sell a lot of shrimp and to reach new customers.

Sunflower Shrimp is located about an hour from the large city of Wichita, which would be an ideal distance and location to expand the business. Deliveries to chefs and restaurants would also be a progressive step, once supply increases. There is also a potential of pairing with smaller grocery stores or meat markets to gain brand awareness.

Communications Strategy.

The points of contact will come through on-site interactions and social media, email, and print. The frequency of emails will be less than the social media updates, to avoid annoying customers. Before shrimp are even available for the first sale, Sunflower Shrimp will begin to educate and invite people to join the Facebook page. This will hopefully spread the word and make for a good first turn out, establishing a customer base early. Promotions will be focused around holidays such as Thanksgiving and Christmas (when shrimp is in higher demand). The goal of promotions will be to simply get people excited about the shrimp when it is in stock.

Public relations are an intangible, yet overly important aspect of an operation like this. The product should be enough to attract a solid amount of customers, but the experience those people have while at the farm will influence how often they return. Sunflower Shrimp will present itself as friendly, hospitable, fun, environmentally conscious, reliable, and trustworthy. This requires a genuine interest in each person who shows up at the door, and a cohesive front among the family involved in the operations. The goal is a constant, consistent networking push to make the experience for the customer as pleasant and memorable as possible. There aren't many new events and activities for families to attend, so coming to the shrimp farm and basically taking home live shrimp is an exciting new experience.

Sales Strategy.

The actual act of selling the shrimp will involve the customer requesting a certain amount of shrimp, the worker going to the tanks, fishing out the correct amount of shrimp, weighing them, packaging them, accepting payment, and sending the person off with a wave and a smile.

IV. Product Line Strategy

Description of Product.

Shrimp fry (baby shrimp) are grown in hatcheries and then subsequently transferred to tanks to grow to market size. Shrimp is a versatile protein choice because “their sweet, mild flavor and firm texture holds up to almost any cooking style from boiling to grilling” (New England Aquarium, 2015). Using a recirculating system also makes it possible to filter out waste and undesired nutrients to reuse as fertilizer for Sunflower Shrimp’s operation, or to sell to customers to use for their gardens.

Sunflower Shrimp’s plan is to sell the shrimp at 18-22 count per pound, which will require a 4 month grow out period from the time the pL’s are delivered. By the end of year 3, Sunflower Shrimp will be able to produce the shrimp faster, needing only a 3 month grow out period. The way the business will achieve this is through innovations in their production methods and through research being conducted by outsiders about alternative feed methods. The shrimp will be bagged on ice for the customer to take home, ensuring the product stays fresh, and also alive until cooking time.

Since Sunflower Shrimp has not personally grown any shrimp yet, they do not have much of an idea of how the product tastes. The business is relying on reviews of other companies who produce the same products using the same methods. The reviews have been very positive, and customers love the product. Some of the comments about the indoor Pacific White Shrimp are:

- “I thought it was a remarkably clean product, great shrimp flavor”

– Chef Gjerde (Jacobson, 2014, p.1)

- “Meatier, larger and fresher-tasting than shrimp bought from the Gulf or frozen shrimp shipped in from as far away as Asia”

– (Rotenberk, 2013, p.4)

- *“They were delicious – the best shrimp I’ve ever eaten”*

– customer of Steiner Farms (Rotenberk, 2013, p.4)

- *“It’s just this magnificent, sweet, pure shrimp flavor, and they are beautiful, like almost translucently clear”*

– Chef Eric Cooper (Arenberg, 2014, p.5)

- *“Indoor shrimp farmers could turn shrimp into a ‘perfect protein,’ delicious and sustainable”*

– (Arenberg, 2014, p.1)

These reviews, along with the popularity of this product, reassures Sunflower Shrimp that indoor tank shrimp farming produces a great-tasting shrimp that will represent the company’s values and ideals well. Since this is a new product that many Kansans will not have seen before, each shrimp order will come with instructions on how to cook the shrimp properly, expiration details, and how to deal with the head-on aspect of each shrimp. Sunflower Shrimp will also provide recipes for free in the lobby, changing them seasonally and perhaps monthly to help customers fully enjoy their shrimp.

In addition to shrimp, the company will produce gift shop types of items to promote the logo and brand and help build awareness for the company. The best product will be an insulated, reusable cooler with the logo on the side. The idea behind this is to replicate reusable grocery bags, so the customers will bring their coolers with them each time they come to buy shrimp from the farm. A product like this will be a great way of obtaining repeat visitors. Sunflower Shrimp will also have t-shirts, shrimp skewers, and pens for sale, all with the company’s logo printed on them.

Benefits of the Product.

Shrimp is a healthy fat that is an excellent source of protein. There are no additives, simply shrimp that have been fed fish meal and have grown up in a secured environment. Shrimp

is extraordinarily easy to cook as well, with many options for variety. It is convenient for a quick and healthy dinner, and also easy to cook in mass quantities for a family or a dinner party.

Competitive Advantage.

As Michael Ziebell – general manager of Ralco Company’s shrimp division – put it best, indoor shrimping allows farmers to “grow shrimp in a confined environment, with a greater ability to control disease and provide a predictable supply of fresh shrimp” (*Fish Site News Desk*, 2015, p.1). This is what recirculating systems have that foreign competition does not have.

Sunflower Shrimp’s primary competitive advantages are:

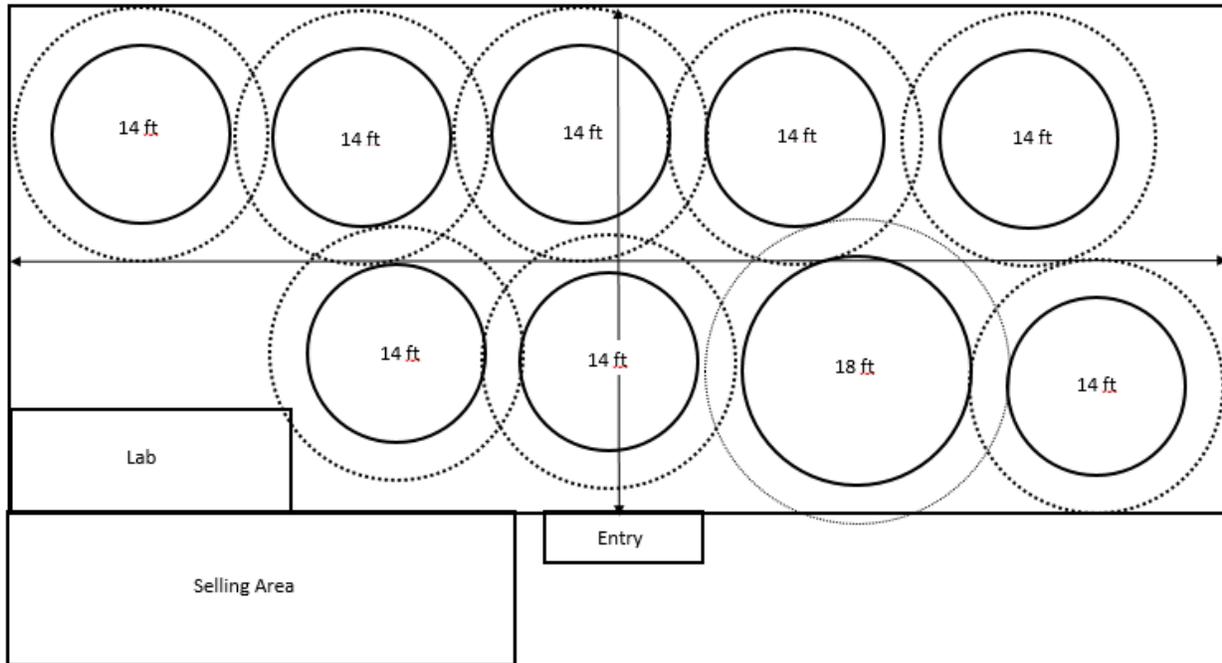
- Fresh shrimp, never frozen
- Locally grown, allowing customers to see exactly where their shrimp is grown
- Less risk of crop failure due to external elements being a non-issue
- Lower cost of preparation

The costs of preparing shrimp “as headless, deveined, or tailless is not possible for many small firms. Therefore, the simplest and most value-value filled choice for these farmers is to market whole, live, head-on shrimp” (Wirth, 2014, p.183). Simplicity will be a benefit for both management, due to the saved time and headache of processing the shrimp, and for the customer, who will save money and get the freshest shrimp possible.

Operations Plan.

The total size of the building is 4,320 square feet. The building will contain 9 tanks, a lab, and the marketing/selling area. A sample building format is shown below:

Figure 2: Potential Building Layout



Over the 4 month grow-out time, the shrimp will be split into different tanks to ensure adequate room to grow. Assuming a 100% survival rate (unattainable, but simpler to demonstrate capacity), the 14ft tanks will generate 518 pounds of shrimp annually over the three cycles. An 18ft tank will generate 1,283 pounds of shrimp in that same amount of time. Eventually, Sunflower Shrimp would ideally have more 18ft tanks to hold grown shrimp, as it is a more effective use of space and resources.

Each day, the water will be tested, the shrimp will be fed, and the equipment will be adjusted. Each tank contains a Biofloc system which uses bacteria to produce feed for the shrimp, while also converting the waste back to a useable form. Each tank will also have air stones that are critical for keeping the water moving and oxygen flowing. When ready to harvest, the shrimp will be scooped out with a net and weighed, then sent home with the consumers.

Development Stage of the Product.

As of April, 2015, Sunflower Shrimp is in the groundbreaking phase. The loans have been obtained for the building, and the excavation should begin this month. The first delivery of shrimp is expected to be delivered by RDM Aquaculture by the end of June, 2015, barring any weather or other kinds of delays in construction. The first harvest should be ready to sell by the beginning of November, 2015. This will let Sunflower Shrimp capitalize on the increased demand for shrimp that comes about during the Thanksgiving and Christmas holidays.

Product Life Cycle.

The product life cycle of a Pacific White Shrimp grown indoors is composed of the following three stages:

-The first larval stage, lasts 3-4 days in a hatchery

-The post-larval (pL) stage, start to resemble adult shrimp, moved to grow-out tanks after 20 days in the hatchery

***This is the stage that Sunflower Shrimp will receive the pL's from RDM Aquaculture.

-Shrimp are in grow-out tanks for 4 months, or until they reach market size of 18-22 count per pound (Sun, 2013).

Even when a hatchery is introduced to Sunflower Shrimp's operations, the timeline will remain the same. The hatchery will run independently of the grow-out operation.

Partnerships.

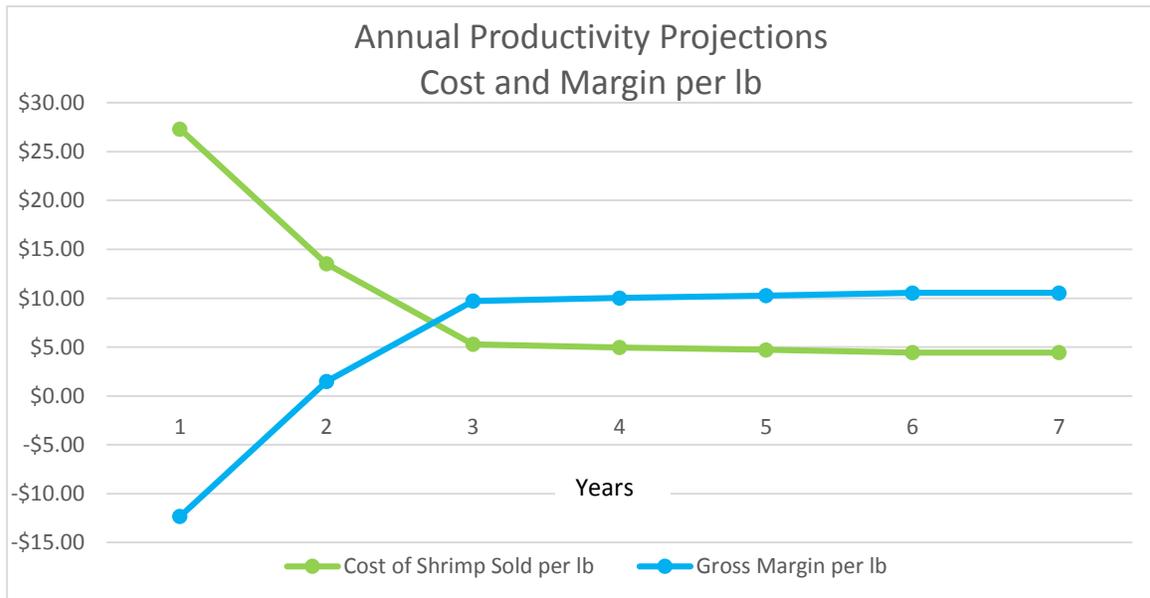
As mentioned previously, partnering with RDM Aquaculture will ensure that the first twelve months, essentially one full round of shrimp, will be monitored correctly and produced efficiently. Sunflower Shrimp owners visited RDM in October 2014, to tour the facilities and learn about their process. RDM have knowledgeable staff members who are eager to help.

Though this is a significant extra cost, it is a risk management tactic that will keep Sunflower Shrimp from wasting valuable resources and product.

Sunflower Shrimp's Research and Development.

Research and development for Sunflower Shrimp will not truly begin until the funds are available to risk experimentation. Observations will be made from the beginning of the business, along with detailed recordings of daily operations. But future R&D will be a major part of the expansion, because the main goal of this business is to continue to improve operations, which could help improve the entire industry. When predicting future improvements of Sunflower Shrimp's facilities, one must take into account the following: cost estimates of innovations, efficiency increases, adding a nursery to decrease purchase price of pL's, and overcoming the initial capital investment. Figure 3 below shows the estimated increase in productivity by year, after taking into account each of these factors.

Figure 3: Forecasts



Each year, the cost of shrimp sold should decrease and the gross margin (revenue minus cost of shrimp sold per pound) will increase.

Industry/Competitor Research and Development.

The industry is growing, it is new, and there is no proven “best” way of producing shrimp indoors. Therefore, most companies are experimenting and expanding. One of the most noteworthy expansions is NaturalShrimp in south Texas. As of March of last year, they were “in the process of raising \$3,500,000 for the construction of the first large scale indoor shrimp facility in North America” (*PR Newswire*, 2014), which the company expects to produce 6,000 lbs of shrimp each week. This is the first time a business has been actively seeking investors, showing that they are pouring any resources into R&D of their facilities.

Though operations like NaturalShrimp are rare, they will become more common each year. This will help the shrimp industry as a whole become more sustainable, because the more America produces domestically, the less they will import from overseas. Americans need an alternative to the frozen, foreign shrimp, and the more people involved in improving the method of indoor recirculating shrimp operations, the more advanced the industry will become.

V. Funding Requirements

-Current funding requirement is \$180,000. Sunflower Shrimp has received \$106,000 in loans to start the business. The remaining \$74,000 has been provided by the owner, Robert Daniels II. Therefore, the business will be funded with 41% equity and 59% debt. Included in this initial estimation of \$180,000 is:

- Building/Electricity/Site Preparation

- Shrimp pL's/Tanks/Water/Feed/Testing Equipment

- Consulting Fees/Logo Design/Promotional Materials

Having that high of debt can be risky, but for a start-up project it is not uncommon. For the next 7 years, there are no plans to borrow more money, unless an expansion becomes possible. The debt is only going to be used on long-term assets, which encompasses the cost of the facility. The time period of the debt request will be a 40 year term. The initial capital investment is large compared to sales, but not when the plan is to have a long-term productive facility. The payback period for the initial investment will be 4 years.

VI. Financial ProFormas

Year 1: Quarterly Pro Forma Statements

Balance Sheet: Quarterly Year 1					
As of 6/30/2016					
	Ending	9/30/2015	12/31/2015	3/31/2016	6/30/2016
		QTR 1	QTR 2	QTR 3	QTR 4
Assets:					
Cash	\$	88,120	72,481	67,878	61,983
Building		92,051	92,051	92,051	92,051
Equipment		82,724	82,724	82,724	82,724
Accumulated Depreciation		4,082	8,163	12,245	16,327
Net Property, Plant, and Equipment		170,693	166,612	162,530	158,449
Total Assets	\$	258,813	239,093	230,409	220,431
Liabilities:					
Accounts Payable		-	-	-	-
Notes Payable		-	-	-	-
Long-Term Debt		106,251	106,251	106,251	104,958
Total Liabilities	\$	106,251	106,251	106,251	104,958
Total Equity	\$	152,562	132,842	124,158	115,474
Total Liabilities and Equity	\$	258,813	239,093	230,409	220,431

Income Statement: Quarterly Year 1					
July 1, 2015 - June 30, 2016					
	Ending	9/30/2015	12/31/2015	3/31/2016	6/30/2016
		QTR 1	QTR 2	QTR 3	QTR 4
Shrimp Sales	\$	-	5,175	11,644	11,644
Promotion Sales		-	-	-	-
Net Sales		-	5,175	11,644	11,644
Cost of Shrimp Sold		4,713	4,713	7,119	7,119
Gross Profit	\$	(4,713)	462	4,525	4,525
Expenses:					
General Expenses		1,000	1,000	500	500
Depreciation		4,182	4,182	4,182	4,182
Total Expenses		5,182	5,182	4,682	4,682
Net Income (Net Loss)	\$	(9,895)	(4,720)	(157)	(157)
Taxes		-	-	-	-
Earnings after Taxes		(9,895)	(4,720)	(157)	(157)

Cash Flow Statement: Quarterly Year 1					
As of 6/30/16					
	Ending	9/30/2015	12/31/2015	3/31/2016	6/30/2016
		QTR 1	QT 2	QTR 3	QTR 4
Net Income	\$	(9,895)	(4,720)	(157)	(157)
Depreciation		4,182	4,182	4,182	4,182
Cash from Operating Activities	\$	(5,713)	(538)	4,025	4,025
Capital Expenditures		(164,775)	-	-	-
Initial Investment		150,000	-	-	-
Cash from Investing Activities	\$	(14,775)	-	-	-
Long-Term Financing		106,251	-	-	-
Long-Term Financing Repayments		-	-	-	(1,293)
Net Working Capital Reserve		(2,356)	(2,356)	(3,560)	(3,560)
Cash from Financing Activities	\$	108,607	2,356	3,560	4,853
Cash Increase (Decrease)		88,120	(15,639)	(4,602)	(5,896)
Cash at Beginning of Quarter		-	88,120	72,481	67,878
Cash at End of Quarter	\$	88,120	72,481	67,878	61,983
Supplemental Cash Disclosures					
Interest Paid	\$	-	-	-	3,586
Income Tax Paid		-	-	-	-

Years 2 – 7: Annual Pro Forma Statements

Balance Sheet: Years 2-7							
As of June 30, 2022							
	Ending	6/30/2017	6/30/2018	6/30/2019	6/30/2020	6/30/2021	6/30/2022
	Year	2	3	4	5	6	7
Assets:							
Cash	\$	62,506	69,204	94,948	127,918	162,270	196,559
Building		92,051	92,051	92,051	92,051	92,051	92,051
Equipment		82,724	98,724	98,724	98,724	98,724	98,724
Accumulated Depreciation		32,653	48,980	65,306	81,633	87,474	93,316
Net Property, Plant, and Equipment		142,122	141,796	125,469	109,143	103,301	97,459
Total Assets	\$	204,628	210,999	220,417	237,060	265,571	294,018
Liabilities:							
Accounts Payable	\$	-	-	-	-	-	-
Notes Payable		-	-	-	-	-	-
Long-Term Debt		104,958	103,620	102,238	100,809	99,332	97,805
Total Liabilities	\$	104,958	103,620	102,238	100,809	99,332	97,805
Total Equity	\$	99,671	107,379	118,179	136,251	166,239	196,213
Total Liabilities and Equity		204,628	210,999	220,417	237,060	265,571	294,018
Asset Intensity Ratio		4.4	3.2	3.1	2.7	2.9	3.2

Income Statement: Years 2-7							
July 1, 2016 - June 30, 2022							
	Ending	6/30/2017	6/30/2018	6/30/2019	6/30/2020	6/30/2021	6/30/2022
	Year	2	3	4	5	6	7
Shrimp Sales	\$	46,575	66,240	70,380	86,760	92,183	92,183
Promotion Sales		-	-	-	-	-	-
Net Sales		46,575	66,240	70,380	86,760	92,183	92,183
Cost of Shrimp Sold		28,476	23,325	23,325	27,325	27,325	27,325
Gross Profit	\$	18,099	42,915	47,055	59,435	64,858	64,858
Expenses:							
General Expenses		2,000	2,000	2,000	2,000	2,000	2,000
Depreciation		16,728	16,728	16,728	16,728	6,244	6,244
Total Expenses		18,728	18,728	18,728	18,728	8,244	8,244
Net Income (Net Loss)	\$	(629)	24,187	28,327	40,707	56,614	56,614
Taxes		-	5,172	6,219	9,326	13,315	13,328
Earnings after Taxes		(629)	19,015	22,108	31,381	43,298	43,285

Cash Flow Statement: Years 2-7							
As of June 30, 2022							
	Ending	6/30/2017	6/30/2018	6/30/2019	6/30/2020	6/30/2021	6/30/2022
	Year	2	3	4	5	6	7
Net Income	\$	(629)	19,015	22,108	31,381	43,298	43,285
Depreciation		16,728	16,728	16,728	16,728	6,244	6,244
Cash from Operating Activities	\$	16,099	35,743	38,836	48,109	49,542	49,529
Capital Expenditures			(16,000)				
Additional Investment							
Cash from Investing Activities	\$	-	(16,000)	-	-	-	-
Long-Term Financing							
Long-Term Financing Repayments		(1,337)	(1,382)	(1,429)	(1,477)	(1,527)	(1,578)
Net Working Capital Reserve		(14,238)	(11,663)	(11,663)	(13,663)	(13,663)	(13,663)
Cash from Financing Activities	\$	(15,575)	(13,045)	(13,091)	(15,140)	(15,189)	(15,241)
Cash Increase (Decrease)		524	6,698	25,745	32,969	34,353	34,288
Cash at Beginning of Year		61,983	62,506	69,204	94,948	127,918	162,270
Cash at End of Year	\$	62,506	69,204	94,948	127,918	162,270	196,559
Supplemental Cash Disclosures							
Interest Paid	\$	3,542	3,497	3,451	3,402	3,352	3,301
Income Tax Paid (22%)		-	5,172	6,219	9,326	13,315	13,328

Analysis of the Financial Statements.

-This operation is not one that will see returns quickly, so a certain level of patience is required. The costs are high initially, but SS spent more money on quality buildings and equipment that will last a long time. The hardest part is getting started, but after the first three years, the return on investment should begin to be steady and substantial.

-Decreased costs will occur as the efficiency of operations improve. Currently the year by year survival rates account for management's lack of experience and for the mistakes that will be made as the operation is in the beginning phase. Figure 3 below shows the expectation Sunflower Shrimp has for survival rates of the shrimp:

Figure 3: Predicted Survival Rates of Shrimp

Year	1	2	3	4	5	6	7
Survival Rate	50%	75%	80%	85%	80%	85%	85%

The initial survival rate is predicted low to avoid expecting returns that will not be there. Overall, many business people today would not partake in this project, due to the high Internal Rate of Return and the risk associated with a new type of production. But the management at Sunflower Shrimp has experience in agriculture and learned the patience that comes with raising crops.

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