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Putting The Honey On The Table: A Business Plan To Create A Successful Part-Time Beekeeping Operation

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Abstract

The objective of this thesis was to use a survey targeted at different niche markets to gain insights about different honey bee products and thereby to provide information for their economic feasibility when produced on a small, local scale for retailers that support such producers and cater to such consumer demand. Since cost of production information about operating an apiary is widely available, the focus of this work was on gaining marketing knowledge. One of the aspects of the survey was to develop a better sense of what potential resellers of honey bee products considered locally-produced. Another objective was to determine packaging preferences for honey and honey bee products as well as bee pollination services. Using that feedback, a marketing plan for different niche markets can be developed for part time, small-scale bee keeping operations. The survey results pertaining to local retailers and end users in Northwest Arkansas, as queried in the fall of 2016, suggested a supply radius near 100 miles and a preference for small packaging in general. Interestingly, simple and small packaging in glass jars was preferred over plastic and larger container sizes. More intricate packaging designs, least cost supply, and at least regional brand recognition were not deemed as important as ensuring locally sourced, fresh product that can be sold at a premium. Different niche markets revealed both similar and different priorities related to these marketing aspects. In a small way, this research may also assist honey bees to recover from colony collapse disorder (CCD).

Introduction

Historically, honey has been a delicacy to people around the world. For example, Egyptians held honey as a prized possession and placed it in tombs with pharaohs. In Nepal, honey hunters climb looming rock faces to gather the sweet reward from furious wild bees. Even in Greece and France many famous baked goods, such as baklava and croissants, are wonderfully complemented by honey. Beekeepers go to great lengths and face bitter stings for the sweet nectars that lay within a beehive. Hence, honey bees have been respected for thousands of years because of the great benefits that they bring to the table. Many people in agriculture have long understood the importance of the honey bee, not only for honey, but also for pollination. However, when the latter is at risk, as the declining honey bee population has threatened, the general populace begins to pay attention.

The common honey bee pollinates roughly $20 billion worth of agricultural goods in the US (Mandal, 2011). According to the honey report of the USDA NASS (2017), about 766,000 pounds of honey were produced by small beekeepers with 5 colonies or less in 2016. Unfortunately, bees around the world have been dying at alarming rates due to something called colony collapse disorder (CCD), and there does not seem to be a clear reason for the population decline (EPA, 2016). There is a dreadful fear of losing the great pollinators and all of the wonderful benefits that come with them. More than $12 million (Purcell-Miramontes, 2017) has been invested in USDA-NIFA research over the past decade and efforts have been set into motion to correct this issue. While a root cause and remedy for CCD has yet to be discovered, there has been a worldwide push for increasing the number of beekeepers and therefore bee colonies. In this time of need, want, and interest, there are massive humanitarian and business opportunities (Wu et al., 2014).

Many people across the United States and around the world dove into becoming beekeepers. Many entered the trade to grow bee populations and help the environment, but some are finding that beekeeping can be more than just a hobby; it can become an additional income. Many more Americans want to get involved for either environmental or monetary reasons, but are afraid of blindly entering a business that could consume a lot of time and money. Fortunately, with the right information, help, and business advice it may well be possible for a full time working man/woman to run a small, yet successful part-time beekeeping operation.

The objective of this study was to collect data and distribute it in a meaningful manner for the benefit of those interested in operating a successful, part-time beekeeping operation. The aim is to aid those just starting out, as well as those with established beekeeping operations in their journey to start or continue beekeeping in ways that meet consumer demand. Providing unbiased information about demand, available markets, and needs for different honey products will be the primary focus. There is a wealth of information that tells people how to keep bees, but there is a lack of resources that educate small beekeepers on how to market their products. The purpose of this project was to explain what niche markets are out there, how to assess those markets, and to provide summary observations made during this research project.

Materials and Methods

A review of literature and investigative efforts with supplies companies and existing beekeepers revealed ample information about how to most efficiently start and run a beekeeping operation from a cost perspective of doing business. Appendix A provides a list of websites that proved useful for collecting cost of production information needed to run an apiary. Market information on the other hand was much more difficult to find. As such, the focus of interest converged on needed market research that had an initially broad target. However, the magnitude

of questions to ask was overwhelming and hence a more local effort in Northwest Arkansas was deemed more appropriate to curtail the number of questions needed to provide meaningful answers. An on-line questionnaire was developed to gather valuable information from local markets, including retail stores, breweries, and small farmers in Northwest Arkansas. The University of Arkansas Internal Review Board approval for this questionnaire was obtained prior to data collection (Appendix B). Questionnaire data was summarized and analyzed to assess potential demand for product type, packaging, pollination services, and to gain a greater understanding of how important the local production aspect was to retailers. Retailers were split into three respondent groups or niche markets that consisted of grocery stores, restaurants, and coffee shops named "Retailers", local fruit and vegetable "Growers" that might also be in need of pollination services, and local "Brewers" that might be interested in honey to make mead (honey beer) or even honey wine or whiskey as well as serving honey in their eateries if available.

Qualtrics

Qualtrics is an online survey system that is regularly employed by the University of Arkansas. It is a wonderful tool for collecting primary data for research projects. A template is chosen and then the creator of the survey can change and shape most aspects of the questionnaire to fit his or her needs. Questions are added and the survey, available on-line, can be easily accessed by respondents using a link that is sent via e-mail. Three surveys were formed in Qualtrics; they were then critiqued and edited. Through this process each question asked was simplified to be clear and concise so as not to be overwhelming. Further, each survey was shortened to take less than five minutes as estimated by the Qualtrics software. An online survey method was the tool of choice to get results quickly. Online surveys, as opposed to phone or

mail questionnaires, offer a low cost option with immediate results that do not require data entry by the surveyor (Salant and Dillman, 1995). On November 10, 2016, surveys were initially released online and sent by email to potential respondents via blind carbon copy to avoid compromising anonymity of respondents. The survey sample included ten "Brewers," ten "Growers," and twenty "Retailers". While the "Brewers" and "Growers" samples represented the local population of respondents for which e-mail addresses could be obtained, the "Retailers" sample was a randomly selected sample of the local population. A follow up email was sent on November 15, 2016. A third and final contact was made on November 22, 2016 to "Retailers" only as the response rate for this group was lowest.

The questionnaires can be found in Appendix C. For each respondent, the surveys assessed what honey bee products were carried and whether there was interest in other products (Sections 1, 2 and 3). Products analyzed ranged from raw, flavored, creamed (micro-crystalized) or crop-specific (monocrop) honey to bees wax, lip balm, pollen, mead, honey wine, and honey whiskey to honey that included the honey comb. Next the term "local" is ambiguous with no clear definition. Hence the survey sought to quantify the "local" concept in terms of allowable distance from the retail outlet (Section 3). This was deemed important to better understand what is local and to help with the definition of local in later questions. Using a 5-point Likert scale ranging from "Strongly Agree" to "Strongly Disagree" and a "Don't Know" option, respondents were asked to indicate their level of agreement to statements about the importance of local production, production within the US, fair retail market access for local small-scale to mid-sized producers, and finally brand recognition with at least a regional label (Section 4). Another question asked for five supplier characteristics that would impact likelihood of purchase from a local supplier (Section 4). Answers to these two questions allowed an assessment of relative

importance of key marketing concepts the respondents' deemed important and thereby helpful for a honey bee producer's marketing plan. Next, there were two questions that asked questions about packaging options for honey (Section 5 and 6). These questions would further narrow marketing plan options in terms of desirable packaging that may vary by niche market. Finally, an open ended question allowed survey participants to voice their opinion about potential missing questions or other helpful information (Section 6).

The "Growers" survey asked some additional questions to elicit what type of fruit or vegetable they grew on their property. This was important to determine if pollination services would be needed. Along those lines, they were asked if they had bees on their property, and if they were their own bees or if they were contracted bees. This was asked to see if there is a need for bees on properties that grow produce. For the same reason a question of how many colonies and the need for additional colonies was asked.

Relative Importance

To assess relative difference about importance of product aspects, packaging options and supplier attributes, individual Likert Scale responses were coded using 1 = "Strongly Agree" to 5 = "Strongly Disagree". Using responses coded in this fashion and averaging across all respondents and questions for a particular topic provided a baseline level of agreement to questions asked. To assess whether a particular question in a topic carried more relative weight than another question, the average response for a particular question across respondents was compared to the overall average response for the topic. Deviations from the baseline average were then graphed in a bar graph and color-coded green (light gray shade) to indicate relative importance within a topic and color-coded red (dark gray shade) to indicate relative lack of importance to draw attention to marketing factors that mattered most to respondents.

Results and Discussion

Market Appeal

All Respondents:

A product having market appeal is of utmost importance when trying to secure sales. While there was interest in every honey bee product, some of the products that were relatively more appealing to survey respondents included raw honey, crop-specific honey, lip balm, and honey wine. Overall, flavored honey, creamed honey, honey straws, and pollen received weaker feedback about relative market appeal. Respondents were relatively indifferent when it came to honey whiskey and bees wax. Figures 1 and 2 provide a summary of findings. Statistical tests comparing frequency distributions of answers across products were not performed given the small sample size. Responses are provided and summarized using average rankings as well as a bar chart indicating relative importance.

Brewers:

While the deviation from the average for raw honey was only -.08, brewers were the only respondent group that stated that raw honey had relatively low market potential. The brewery survey resulted in flavored honey, honeycomb, pollen, and honey wine also receiving a relatively low rank in reference to market potential. Crop-specific honey, creamed honey, honey straws, lip balm, mead, and honey whiskey received relatively high ratings for market potential. While the breweries seemed to agree that only a few honey bee products had significant market potential, they agreed heavily in an area they are familiar with -- alcohol. The breweries that responded leaned towards honey whiskey and mead as relatively important. This was anticipated and expected. The strongest positive responses came in for mead, with 100 percent of respondents entering “Agree,” and honey whiskey, with 75 percent of respondents entering

"Agree." Additionally, three of the breweries that stated that they don't carry mead, indicated that they would like to.

Growers:

Raw honey, crop-specific honey, honey comb, honey wine and whiskey appeared to really catch the attention of growers, whereas flavored honey, honey straws and pollen did not. Small farmers were indifferent about creamed honey, bees wax, lip balm and mead. Mead requires refrigeration while bees wax and lip balm are not food items and thereby may not fit their niche market. Micro-crystalized or creamed honey is a specialty product that this set of respondents may not be well informed about.

Retailers:

Out of all twelve honey bee products that the survey asked about, ten products received a "Strongly Agree" or "Agree" from 50 percent or more of the respondents. Products that have a majority agree rate (higher that 50% of respondents strongly agreeing or agreeing) included raw honey, crop-specific honey, flavored honey, honey comb, bees wax, lip balm, pollen, mead, honey wine, and honey whiskey. The only products that did not have a strong positive response were creamed honey and honey straws. The strong response on almost all of the products having market potential shows the entrepreneurial spirit of the local retail store. These businesses are continually searching for new products, suppliers, and opportunities. Creamed honey as well as honey straws may be foreign and unknown, leading retail stores to be less interested in them. Leading products were raw honey, crop-specific honey, honeycomb, lip balm, and honey wine. Flavored honey, creamed honey, honey straws, pollen, mead, and honey whiskey were relatively unpopular when it came to market potential.

What is Considered Local?

All Respondents:

The most common response to the question about what distance, in miles, is considered local across all three surveys was 100 miles. Just short of 40% of the results indicated 100 miles as the limit. An equal percentage, 37.5%, stated that less than 100 miles was considered local. From these survey results, retailers deemed to judge "local production" as a product that is produced within 100 miles of the retail outlet. Among all respondents the average response to the question about what is considered local was 99.8 miles. A Chi-square test about differences in the distribution of responses by market group revealed no statistically significant differences ($p = 0.84$). This is a function of the small sample size. Results are still reported by respondent group as shown in Figure 3. Brewers showed the greatest range in responses to this question perhaps to increase their supply region. Local "Growers" leaned toward a greater distance, as that would expand their market area. Finally Retailers had the narrowest range of responses and desired a more proximal market region to allow a 'local' description for products sold.

What Product Attributes were Deemed Important?

All Respondents:

Beekeepers that are trying to sell their 'local' product to different stores, breweries, and growers would benefit from knowing what concepts are important to their clientele (Figure 4). The survey asked about the importance of local supply, whether the product is made in the US, whether opening the marketing channel to small-scale to mid-sized operations was something they were concerned with and whether a product with at least regional brand recognition was necessary. Two of these four concepts stood out as important in the overall results. First, sourcing locally when possible is crucial and suggests strong market potential for locally sourced

honey bee products. Second, most respondents believed that small and mid-sized farms should be given a chance to participate in the food supply chain, which also favors small bee keepers. Respondents were relatively indifferent on the issue of sourcing within the United States and did not care about the label. Apiaries may therefore be advised not to spend too much time and effort toward branding their product.

Brewers:

Brewers found brand recognition and U.S sourcing to be of little importance. A honey brand would likely be lost to a brewery because a brewery would use honey as an input instead of a final good. Brewers do prefer to source locally when possible and hold this as a relatively important point in their business. Additionally, brewers find it critical that small farms get a chance in the local market.

Growers:

The relative results for growers are slightly skewed due to the high level of agreement across all four statements, as seen in Figure 4. The highest rank logically lies in the belief that small and medium sized farmers should get a fair chance at the food supply chain. It is natural for growers to align with this statement because it is talking about them as small producers. Growers also viewed U.S. sourced goods as being relatively important. Finally, brand recognition and sourcing locally both received negative deviations from the average even though they were mostly agreed with.

Retailers:

Brand recognition once again fell short in the retailer survey results with the largest deviation from the overall average. Retailers did however find it most important to source

locally as serving 'locavores' is a current hot topic in retailing (Gogoi, 2008). Next, this group of respondents deemed giving small farmers a fair chance as relatively important.

Supplier Characteristics

All Respondents:

Knowing what characteristics buyers value in a supplier allows the small beekeeper to hone specific areas of his or her selling approach for different target markets (Figure 5). The aggregate results stated that locally sourced goods were the most important characteristic when it comes to supplying their establishments. This point is key for beekeepers to take note of; sourcing honey and honey bee products locally has market appeal in the eyes of the respondents surveyed. Next, when the results from all three surveys were combined it was clear that it is attractive to have a supplier that provides fresh product. Providing fresh products is important to ensure that quality goods can be passed on to the consumer. This is an expected result because everyone likes to have fresh foods. While being punctual and friendly was part of the definition of 'Easy to work with', this factor was deemed less important in relation to the other defined factors.

Cost is important to buyers, but when compared to a handful of other options the respondents were relatively indifferent about the cost of products. In reference to honey this characteristic is likely of little concern because of the expected health benefits of honey. Beekeepers should realize that if they offer a local and fresh product then they might be able to request a higher price.

Beyond the four base options to be organized from most important to least important was an "other" option. Only two respondents moved the "other" option out of the least important position; they moved it to the most important position. The explanations for the alternate

answers consisted of "unique comb display" and "taste." Therefore, at least one respondent highly valued a unique honeycomb design. Also, at least one respondent thinks that taste was the most important aspect when looking for suppliers.

Brewers:

This niche market was most concerned about cost in comparison to the other niche markets. This is understandable since honey may be used in mead production as an input and protecting margins with lower input cost thereby makes sense. The remaining aspects ranked similar to overall results.

Growers:

Small farmers that were surveyed pointed out that they found locally sourced goods to be the most important option with a 1.25 deviation from the average. Growers are expected to find this area important because it is the main reason they have business; if local goods provided to the local market were not valued, then they most likely couldn't compete with larger farms. More than the other two groups surveyed, growers assigned relative importance to working with kind and punctual suppliers.

Retailers:

Local coffee shops, grocery stores, and restaurants find locally sourced products to be exceptionally important. Like the growers, these local establishments think that offering locally sourced foods serves a niche market that can potentially reap greater marketing margins. Without a significant level of interest in locally sourced goods the larger, more efficient businesses would likely crowd out local suppliers. Again, freshness was valued whereas least cost was not as important. 'Easy to work with' received least importance in contrast to the other

two sectors. It is hypothesized that retailers require this supplier attribute as a necessary factor of doing business with them.

Preferred Packaging Size

All Respondents:

Figures 6 to 7 point out what is preferred overall by the survey respondents. The general trend among the local businesses is a demand for smaller packaging starting at half-pints and there is less demand as the packaging size increases. More respondents said "yes" than "no" when asked if they would want honey packaging that ranging from honey straws to quart-size containers, but then there were more negative than positive responses for gallon and five-gallon containers. The only exception in the statement that smaller packaging is preferred is the example of honey straws; honey straws were not highly attractive across all respondent groups.

Figure 8 illustrates what packaging materials and type of design were preferred for honey packaging by respondents. Each survey respondent could choose as many attributes as they would like on this particular question. It is clear to see that overall glass is the preferred material for packaging honey. When it came to having a decorative or simple design or style of package the respondents were split in their decision; some are satisfied with a simple design while an equal number are happy with a more complex design. As a result, and in line with the importance of having a regional brand, beekeepers may consider paying less attention to this area of their marketing plan.

Brewers:

Smaller packages of honey were highly preferred relative to containers sizes such as quart, gallon, and five-gallons (Figure 6). Honey straws are the most preferred package size, followed by half-pints and then pints. This was counter to expectations as breweries were

expected to buy large quantities of honey for mead production. The results may pertain more to using honey in the eateries than for adding a flavor option to their beer line.

Growers:

According to survey respondents and Figure 6, growers heavily prefer half-pints and pints followed by quarts. Honey straws, gallon, and five-gallon containers received relatively negative responses with five-gallon honey containers being the least favorite. It is hypothesized that smaller-size packaging allows for honey to be an impulse purchase on small produce farms interested in selling their produce rather than honey. That is the honey purchase does not cannibalize produce sales from a purchaser's budget constraint perspective.

Retailers:

Retailers responded to the survey in a fashion similar to observations made for the growers; the two respondent groups followed the same trends in what type of packaging is preferred for honey. Small packaging allows the consumer to try out a product that they may not use in large quantity without spending a lot of money.

Need for Pollination Services

Table 1 summarizes answers to questions posed to growers about their need for bee colonies, pollination services and whether or not they sell honey. Results suggest that there may be room to market to this niche market both in terms of honey sales as well as setting up pollination contracts.

Open Response

Brewers:

Table 2 sheds light on what free form responses were collected from the survey sent to microbreweries. This group gave some feedback that shed light on some of the legal issues

breweries would deal with when working with honey. One respondent stated, "As far as honey is concerned we currently aren't licensed to make mead, nor do we use raw honey in any of our beer. Nor are we permitted to sell outside food products." All of these points are important for beekeepers to know when dealing with breweries. The same respondent also said, "Raw brewing ingredients are going to be purchased based upon the beer style so it's impossible in some instances to buy local." Local inputs are good when they can be acquired, but if they don't meet flavor or cost expectations, then breweries are not afraid to look elsewhere. Finally, one brewer stated that he or she "would be more likely to use honey in beer production than sell it to customers," while another said "We use no honey in our products as of now." An entrepreneurial beekeeper should view this as an opportunity and a market to fill; both respondents answered that they were open to considering honey bee products as either an ingredient for beer production or as a product in their eateries.

Growers:

"Blueberry grower looking for hives" is what one respondent volunteered in the open response portion of the survey. This result quickly put concerns about there being a market for pollination services at the local level to rest. Another respondent stated that they "use honey only as a sweetener. It's a free product to our customer, so price is the penultimate thing." The act of leaving honey out as a sweetener on tables seems to be a common trend at coffee shops and restaurants. This seems to decrease the demand for high-end local honey because it can be consumed at an unregulated rate with an unseen return.

Retailers:

Retailers are heavily focused on their customers and therefore try to purchase honey that their customers would appreciate. For example a retail respondent stated, "Customers are

usually looking for local honey to help with their allergies. As well as bee pollen, because that works just as well as honey does for allergies. Coming from a customer's point of view, the price matters as well. But once the customer knows that they're getting local, raw honey, their willing to pay more for the product." This quote is highly valuable for a few reasons: it describes why consumers demand certain products, what products consumers demand, the character traits that the product needs to have to be sold for a higher price, and the importance of price to the average consumer. Armed with this information a beekeeper can better sell to retailers. Another respondent wrote in Table 2 about a certain honeycomb product that the business was seeking for a particular baked good. This statement points to the strong entrepreneurial spirit of retailers; if a beekeeper is interested in testing out a new product, then retailers appeared more adventurous in comparison to brewers and growers and are more likely to try different things.

Conclusions

All Respondents:

While it can be seen from the survey results that there are multiple marketable products, it is best to first target small retail markets with simple products and small packaging (Figures 1 and 7). These markets may include local health food stores, coffee shops, and breakfast restaurants. This conclusion is drawn because small packaging- such as half pints, pint, and quart- offer a lower budget hurdle for the consumer even as packaging cost per pound of honey sold is likely higher. Bulk containers of honey, such as a gallon and a five-gallon bucket are an unrealistic and difficult option for part time beekeepers. Buyers that desire bulk honey largely want to add the honey to other food or drink products, and therefore are not willing to pay as

large of a premium. A larger margin can be secured by a beekeeper that promotes and sells honey straws, or a glass jar of honey that can in turn be resold.

The production of simple bee products would be heavily recommended (Figure 1). While value added products such as lip balms, creamed honey, and mead have some market appeal, they are not always the most economical decision (Figure 2). It takes some know how, time and capital investment to produce these products at a level where profit is possible. More often than not, it would be a decision for a part time beekeeper with a full time job to offer raw honey, honeycomb, and bees wax to any of the local markets. If a beekeeper has extra time to invest and would like to experiment with value added products then crop-specific honey, creamed honey, and flavored honey are good places to start.

When marketing honey, marketing it as a local product is important (Figure 4). Supplying establishments that are closest to the apiary is encouraged; there is a popular belief that local honey helps with allergies (National Honey Board, 2017), and consumers want to purchase honey as close to the source as possible (Table 2). This approach is more likely to ensure a higher price for one's honey, while keeping transportation cost low. If the most local market becomes saturated it is advised that a small beekeeper only branches out short distances at a time. Using a mapping application, such as Google Maps, it is possible to find retail outlets that might be looking to sell honey within a specified radius that should not exceed 100 mile as 'local' branding may be compromised (Figure 3). In addition, it may be worth it to build retailer connections with products that are profitable and avoid saturating the market by contacting competitors in the same market or region. This will maintain interest in the product by existing retailers and reduces retailer incentive to lower price to gain market share thereby hurting

beekeeper margin and potentially exhausting available inventory with unexpected demand pressure.

Being punctual and friendly as a beekeeper and honey supplier is important although the survey respondents did not necessarily rank it as high as fresh and locally sourced product (Figure 4). Beekeeping is relatively unique and many consumers can identify a connection to a beekeeper, whether it is a friend or a great grandfather. The image of the small beekeeper is part of the appeal of eating local honey, so the image must remain unstained. Everybody likes to work with someone that values his or her time, is ethical, and is kind. It is important to be transparent and honest in the local market. If a beekeeper messes up even once, the word can travel quickly and the entirety of a local market could be lost. Don't cut the supply of honey with sugar water and don't ship in honey to make it appear as local honey. These acts are dishonest and will be caught sooner or later. A lack of integrity is likely to result in harsh consequences.

Just like any product found on the shelf of a grocery store, it is good to have an appealing label. Some people see honey as a commodity and some people just have trouble deciding between brands; a nice label and container can set one brand apart from the competition. To create a quality logo a beekeeper should choose a target market and make a label that will be appealing to that crowd. Nonetheless, the survey results show that spending too much time and effort on labeling and branding may not be worth the effort when compared to other product attributes discussed above (Figure 8).

The national price of honey was $2.08 per pound in 2016. With a price this low, a hobby or part time beekeeper would struggle to meet cost (NASS, 2017). The key is to differentiate from the competition. Do what no one else is doing, or do something better than everyone else.

Find a niche and fill it to the point where there will be no room for the competition. This niche can simply be supplying high quality honey in an area that has a lack of other beekeepers, or it can be unique packaging, or even adding flavor to one's honey. Beekeepers should realize that if they offer a local and fresh product with a friendly disposition in a market with relatively low competition, then they may be able to request a premium (Table 2 and Figure 5).

Before beekeepers sell to brewers, retailers, or any market with greater licensing requirements and or larger minimum volume requirements, they might consider selling their products directly from their farm, apiary or in markets that have lesser restrictions and licensing requirements. These markets include selling in person, from home, to small pick your own farms, etc. These markets offer lower cost as there are likely to be less licensing and packaging laws that come into effect in comparison to selling to a retailer or wholesaling. Different states have varying laws. Look to appendix A for further information on this topic.

Brewers:

Providing honey to breweries as a small beekeeper may prove to be difficult because of the quantity of honey demanded. Brewers need large amounts of honey for brewing and/or restaurant purposes. Most small beekeepers cannot provide large amounts of honey, and even if they could it is more profitable to sell smaller packages to receive larger margins. If it is truly desired to sell bulk honey, then a few beekeepers might get together under one brand to meet that demand. This "team beekeeping" could be accompanied by difficulties that may well be addressed by forming a cooperative or other association that would help with marketing of honey.

Judging by the answers of 'Brewers', local ingredients need to be reasonably priced as the derived demand for beer dictates how much they can pay for inputs (Figure 5). Hence,

bottom lines need to be met by both breweries and beekeepers to allow profitability for both. It will therefore be important for small beekeepers to keep good financial records so they can determine the cost of making different products. There are also legal barriers to working with breweries. Some microbreweries might not be able to work with mead, raw honey, or even food products not produced on site or with USDA approval (Table 2). Beekeepers that are thinking about making their own mead for personal or commercial use need to check on local, state, and federal laws before seriously considering alcohol production.

Nonetheless, honey straws and crop-specific honey seemed to draw the attention of brewery respondents (Figure 1). The honey straws could be an attractive menu addition while the crop-specific honey might appeal to the breweries to market a crop-specific brew or in meal preparation allowing for a higher price and therefore higher margin.

Growers:

Pollination is a necessity for an efficient farm or orchard. Many small producers and farmers realize this so they either own honey bees themselves or they make a contract with a beekeeper to get bees on their land. These growers have a similar mindset as a local part time beekeeper as they are producing products to sell in a niche market. Beekeepers can work hand in hand with this group to create a mutually beneficial relationship as demonstrated in Table 1. If small beekeepers can work with a grower then he or she might be provided with a good place to set up an apiary, solid nectar flows, and sometimes even a seasonal or annual payment from the grower. Additionally, the visual of the hives on a farm, especially a "pick-your-own farm" could increase both produce and honey sales allowing the grower as well as the beekeeper to make some extra money with very little extra advertising. Honey goes wonderfully with fresh fruit, and many people that are willing to pick their own fruit instead of getting it from a store for a

more reasonable price are willing to pay for a product such as high margin local honey and other bee products. This market might also lend itself to selling other, more unique bee products that might be difficult to sell in another more established market. Some of these products could include pure bee's wax, lip balm, honeycomb, honey wine and whiskey.

Honey that is sold by any of the respondents that answered the pollination survey is preferred in small containers such as half pints and pints (Figure 6). This is logical because most sales will be directly to customers and the average consumer rarely buys honey in packages larger than a quart. Additionally, the producers that sell honey said that they get honey mostly on a seasonal basis. This makes sense because many of these businesses naturally operate seasonally and honey production on the small scale is mostly produced and sold seasonally.

Retailers:

Selling honey bee products to retailers can be very beneficial, but can also have some downsides. The benefits can include selling a large quantity of honey in small packages to a single or small number of retailers. This opportunity allows for little hassle and no advertisement needed from the beekeeper. While margins might be slightly lower when selling to retailers instead of selling personally, the value of time should make the transaction worthwhile. On the other hand a beekeeper might have to work with a retailer's system that can be complex. This can include having to make inconvenient deliveries, licensing hurdles and administrative overhead.

Further Research and Study Limitations

If this project were to be conducted again, then it would benefit from a few revisions. First, a more precise survey should be used; the survey that was used was to the point, but it could have been more specific with wording to ensure that respondents knew exactly what was

being asked. Some items that were inquired about, such as creamed honey and flavored honey, could have been unfamiliar items to the respondents, which without a proper explanation could lead to skewed results. This issue could be resolved with additional images, further explanation of the products, and potentially even conducting an in person survey. Additionally, it would be beneficial to let customers of the establishments taste different products and then survey them about their preferences. This information could be valuable by knowing exactly what customers liked and desired. Also, the time line could be extended to include more surveys and a larger survey area and group; more information could be collected as there are many markets that could be analyzed. Finally, it would be beneficial to ask establishments and customers if they valued "Arkansas Grown" goods in addition to U.S. and local goods (Arkansas Department of Agriculture, 2017).

This project had some limitations as well. The scope is narrow, and only applicable to Northwest Arkansas and similar communities. Other areas of the country or world that are diverse in customer base might not find this research as valuable. On the same note, the surveys used for this paper were used in 2016, which limits the time that this research is applicable for. In a few years it may be obsolete. Trends and taste in the food market change quickly and need to be reevaluated regularly. Finally, there are different interpretations of survey questions. Certain phrasing and product names might have confused some respondents, and contacting us was too high a transaction cost. Each respondent is different with varying background, and has different opinions about what terms such as "agree," "local," and "important" mean. Many of the issues that arose during this project's research process could not be helped but are noteworthy to state.

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Table 1. Grower Responses to Pollination Services Questions (Appendix C – Grower Survey)

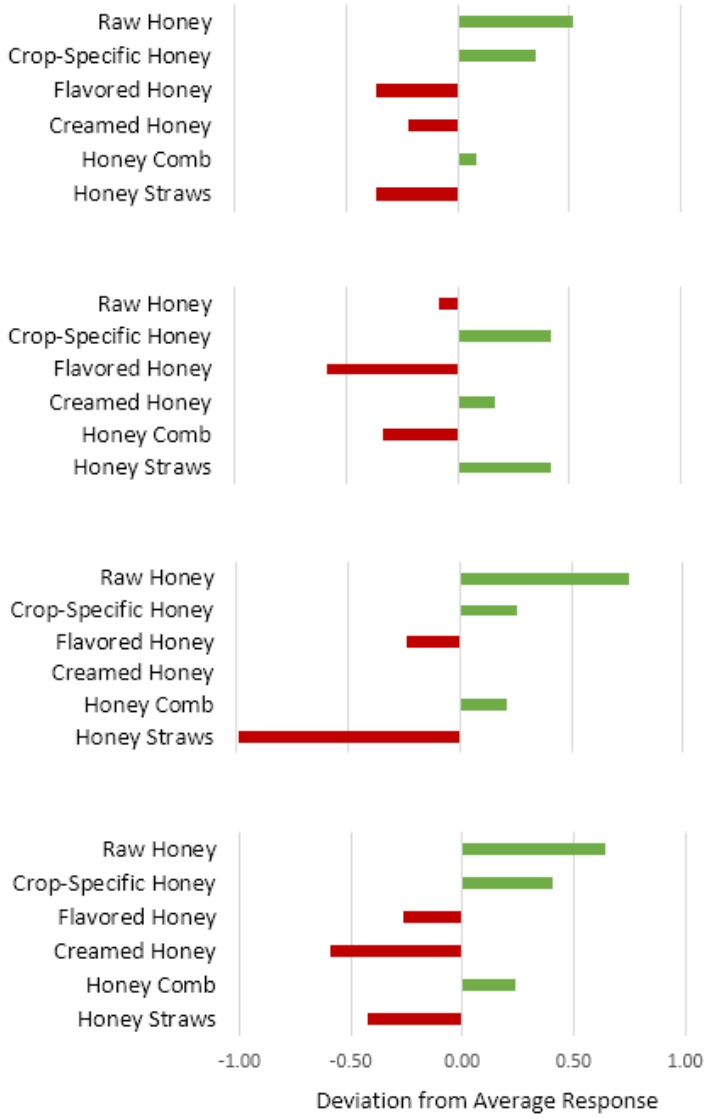
Question	**# of respondents**	**Yes**	**No**
Do you have honey bees on your production site for pollination?	5	4	1 – but would like to
Would you prefer local beekeepers or a larger commercial service?	5	4 Local	1 -- Does not matter
How many colonies to do you need Are they *owned* vs. **contracted?** (Do you sell honey?)	5	*1-5* (sells honey) 6-10 (does not sell honey but is interested and did not indicated owned vs. contracted) **11-15** (does not sell) **16-20** (is interested in selling)	Needs none – owns *6-10* colonies & sells honey

Table 2. Open Responses by Respondent Group (Appendix C Section 6)

Brewer 1	"I would be more likely to use honey in beer production that sell it to customers."
Brewer 2	"These questions were almost too general to apply to a brewery in our area. For me a lot of raw brewing ingredients are going to be purchased based upon the beer style so it's impossible in some instances to buy local. As far as merchandising goes, we do try to shop as local as possible as long as budget and time constraints are met. As far as honey is concerned we currently aren't licensed to make mead (honey wine) nor do we use raw honey in any of our beer. Nor are we permitted to sell outside food products."
Brewer 3	"We use no honey in our products as of now."
Grower 1	"Blueberry grower looking for hives."
Grower 2	"Hi! We use honey only as a sweetener. It's a free product to our customer, so price is the penultimate thing. Thanks"
Retailer 1	"This info does not necessarily reflect what the retailer desires but more what I've heard from consumer requests. In turn, what the consumer wants will reflect what the retailer desires I suppose."
Retailer 2	"From my experience, customers are usually looking for local honey to help with their allergies. As well as bee pollen, because that works just as well as honey does for allergies. Coming from a customer's point of view, the price matters as well. But once the customer knows that they're getting local, raw honey, their willing to pay more for the product."
Retailer 3	"I currently am pursuing honeycomb as a featured offing in bakery....small packaging, gift baskets, go with fresh baked goods."

Figure 1. Description of Relative Importance About Market Appeal by Respondent Group (Appendix C Section 2)

	# of Responses						Product	
All Responses (# of obs.)	**SA**	**A**	**N**	**D**	**SD**	**DK**	Avg[a]	Dev[b]
Raw Honey (13)	5	5	1	1	0	1	1.83	0.52
Crop-Specific Honey (15)	3	9	1	1	0	1	2.00	0.35
Flavored Honey (16)	1	5	5	3	0	2	2.71	-0.36
Creamed Honey (15)	1	5	7	1	0	1	2.57	-0.22
Honey Comb (16)	3	6	5	1	0	1	2.27	0.08
Honey Straws (16)	0	7	4	3	0	2	2.71	-0.36
Overall Average[c]							2.35	
Brewers								
Raw Honey (3)	0	1	1	1	0	0	3.00	-0.08
Crop-Specific Honey (4)	0	3	0	1	0	0	2.50	0.42
Flavored Honey (4)	0	0	2	2	0	0	3.50	-0.58
Creamed Honey (4)	0	2	1	1	0	0	2.75	0.17
Honey Comb (4)	0	0	3	1	0	0	3.25	-0.33
Honey Straws (4)	0	2	2	0	0	0	2.50	0.42
Overall Average							2.92	
Growers								
Raw Honey (4)	3	1	0	0	0	0	1.25	0.76
Crop-Specific Honey (4)	2	1	1	0	0	0	1.75	0.26
Flavored Honey (5)	1	1	2	0	0	1	2.25	-0.24
Creamed Honey (5)	1	2	1	0	0	1	2.00	0.01
Honey Comb (5)	1	4	0	0	0	0	1.80	0.21
Honey Straws (5)	0	2	0	2	0	1	3.00	-0.99
Overall Average							2.01	
Retailers								
Raw Honey (6)	2	3	0	0	0	1	1.60	0.64
Crop-Specific Honey (7)	1	5	0	0	0	1	1.83	0.41
Flavored Honey (7)	0	4	1	1	0	1	2.50	-0.26
Creamed Honey (6)	0	1	5	0	0	0	2.83	-0.59
Honey Comb (7)	2	2	2	0	0	1	2.00	0.24
Honey Straws (7)	0	3	2	1	0	1	2.67	-0.43
Overall Average							2.24	



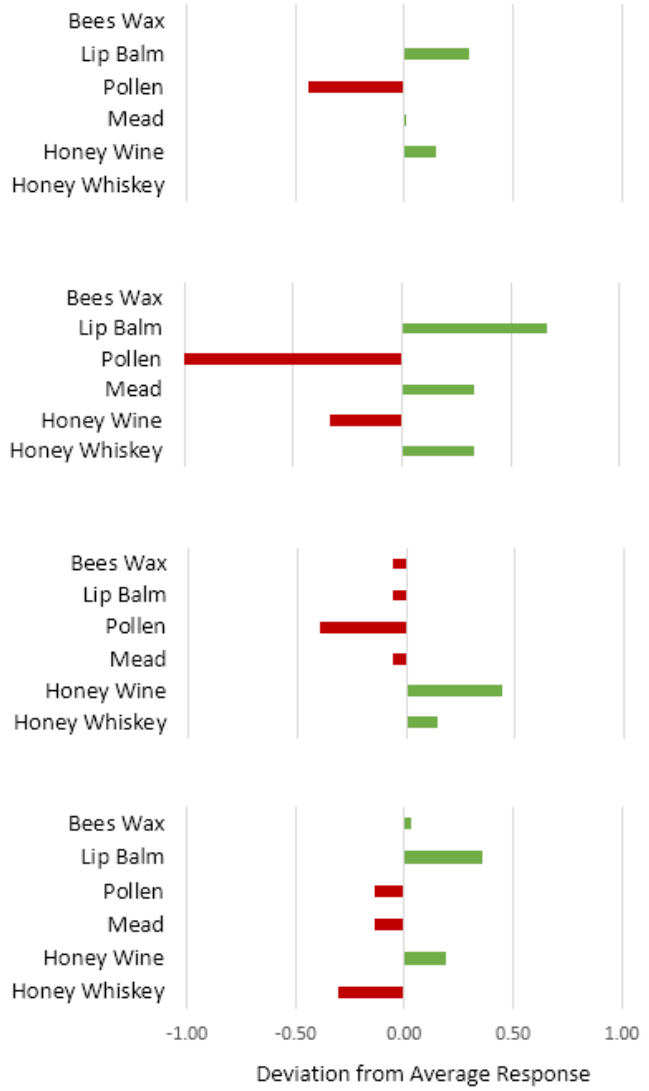
Notes:

[a] 1 = Strongly Agree(SA) ... 5 = Strongly Disagree(SD). Don't Know (DK) counted as observation but excluded from product average shown.

[b] Deviation from overall average. [c]Average of product averages.

Figure 2. Description of Relative Importance About Market Appeal by Respondent Group (Appendix C Section 3)

	# of Responses						Product	
All Responses (# of obs.)	**SA**	**A**	**N**	**D**	**SD**	**DK**	Avg[a]	Dev[b]
Bees Wax (16)	3	6	5	0	0	2	2.14	0.00
Lip Balm (15)	3	9	1	0	0	2	1.85	0.30
Pollen (15)	1	5	5	0	1	3	2.58	-0.44
Mead (16)	2	10	2	1	0	1	2.13	0.01
Honey Wine (16)	3	6	3	0	0	4	2.00	0.14
Honey Whiskey (16)	2	8	4	0	0	2	2.14	0.00
Overall Average[c]							2.14	
Brewers								
Bees Wax (4)	1	0	2	0	0	1	2.33	0.00
Lip Balm (4)	1	2	0	0	0	1	1.67	0.67
Pollen (4)	0	1	1	0	1	1	3.33	-1.00
Mead (4)	0	4	0	0	0	0	2.00	0.33
Honey Wine (4)	0	1	2	0	0	1	2.67	-0.33
Honey Whiskey (4)	0	3	0	0	0	1	2.00	0.33
Overall Average							2.33	
Growers								
Bees Wax (5)	1	3	1	0	0	0	2.00	-0.06
Lip Balm (4)	1	2	1	0	0	0	2.00	-0.06
Pollen (4)	0	2	1	0	0	1	2.33	-0.39
Mead (5)	1	3	1	0	0	0	2.00	-0.06
Honey Wine (5)	2	2	0	0	0	1	1.50	0.44
Honey Whiskey (5)	2	2	1	0	0	0	1.80	0.14
Overall Average							1.94	
Retailers								
Bees Wax (7)	1	3	2	0	0	1	2.17	0.03
Lip Balm (7)	1	5	0	0	0	1	1.83	0.36
Pollen (7)	1	2	3	0	0	1	2.33	-0.14
Mead (7)	1	3	1	1	0	1	2.33	-0.14
Honey Wine (7)	1	3	1	0	0	2	2.00	0.19
Honey Whiskey (7)	0	3	3	0	0	1	2.50	-0.31
Overall Average							2.19	



Notes:

[a] 1 = Strongly Agree(SA) ... 5 = Strongly Disagree(SD). Don't Know (DK) counted as observation but excluded from product average shown.

[b] Deviation from overall average. [c] Average of product averages.

Figure 3. Retailer Response to Acceptable Supplier Distance in Miles from Retail Outlet Considered "Local" by Respondent Group (Appendix C Bottom of Section 3).

Summary Statistics			
Groups	*Count*	*Average*	*Std. Dev.*
Brewers	5	95	93
Growers	5	115	78
Retailers	5	90	28
All	15	100	68

Chi Square Test on Equal variance: F-value (p-value) 0.1756 (0.8411)

Individual Responses		
Brewers	*Growers*	*Retailers*
20	50	51
28	76	73
75	100	100
100	100	100
250	250	125

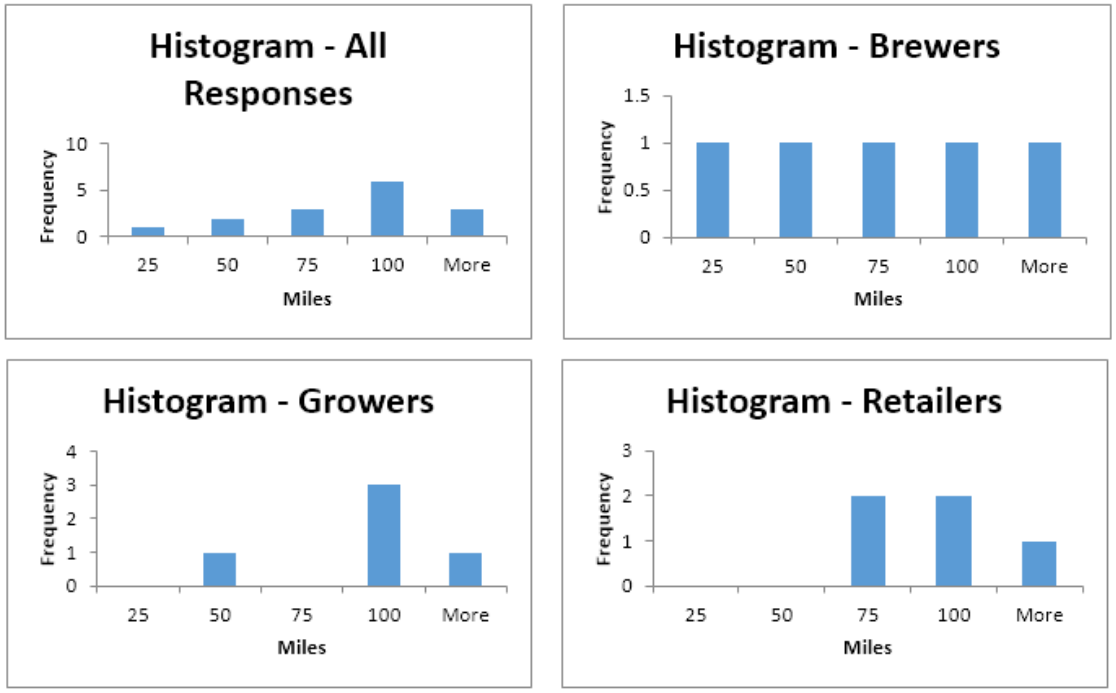
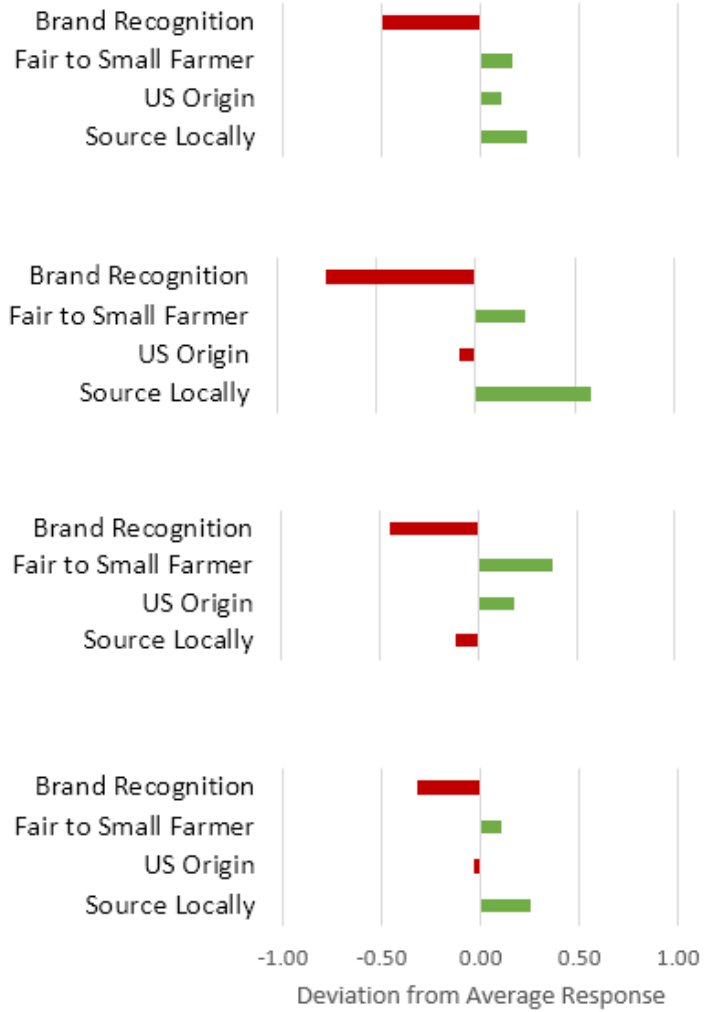


Figure 4. Description of Relative Importance of Retailing Parameters by Respondent Group (Appendix C Top of Section 4)

	# of Responses						Param.	
All Responses (# of obs.)	**SA**	**A**	**N**	**D**	**SD**	**DK**	Avg[a]	Dev[b]
Brand Recognition (19)	7	4	6	2	0	0	2.16	-0.50
Fair to Small Farmer (19)	11	5	2	0	0	1	1.50	0.16
US Origin (19)	12	4	0	2	0	1	1.56	0.10
Source Locally (19)	11	8	0	0	0	0	1.42	0.24
Overall Average[c]							1.66	
Brewers								
Brand Recognition (6)	1	0	3	2	0	0	3.00	-0.75
Fair to Small Farmer (6)	2	2	2	0	0	0	2.00	0.25
US Origin (6)	2	2	0	2	0	0	2.33	-0.08
Source Locally (6)	2	4	0	0	0	0	1.67	0.58
Overall Average							2.25	
Growers								
Brand Recognition (6)	2	3	1	0	0	0	1.83	-0.45
Fair to Small Farmer (6)	5	0	0	0	0	1	1.00	0.38
US Origin (6)	4	1	0	0	0	1	1.20	0.18
Source Locally (6)	3	3	0	0	0	0	1.50	-0.12
Overall Average							1.38	
Retailers								
Brand Recognition (7)	4	1	2	0	0	0	1.71	-0.32
Fair to Small Farmer (7)	5	2	0	0	0	0	1.29	0.11
US Origin (7)	4	3	0	0	0	0	1.43	-0.04
Source Locally (7)	6	1	0	0	0	0	1.14	0.25
Overall Average							1.39	



Notes:

[a] 1 = Strongly Agree(SA) ... 5 = Strongly Disagree(SD). Don't Know (DK) counted as observation but excluded from parameter average shown.

[b] Deviation from overall average. [c]Average of parameter averages.

Figure 5. Description of Relative Preferences in a Supplier and Products by Respondent Group (Appendix C Bottom of Section 4)

	# of Responses					Avg.	
All Responses	**1**	**2**	**3**	**4**	**5**	Rank[a]	Dev[b]
Easy to work with	1	2	9	3	2	3.18	-0.18
Fresh	2	9	4	2	0	2.35	0.65
Least Cost	3	3	3	8	0	2.94	0.06
Locally Sourced	9	3	1	4	0	2.00	1.00
Other	2	0	0	0	15	4.53	-1.53
Overall Average (# of obs.)						3.00	(17)
Brewers							
Easy to work with	1	1	2	1	1	3.00	0.00
Fresh	0	4	2	0	0	2.33	0.67
Least Cost	2	0	2	2	0	2.67	0.33
Locally Sourced	2	1	0	3	0	2.67	0.33
Other	1[c]	0	0	0	5	4.33	-1.33
Overall Average (# of obs.)						3.00	(6)
Growers							
Easy to work with	0	1	3	0	0	2.75	0.25
Fresh	1	1	1	1	0	2.50	0.50
Least Cost	0	2	0	2	0	3.00	0.00
Locally Sourced	3	0	0	1	0	1.75	1.25
Other	0	0	0	0	4	5.00	-2.00
Overall Average (# of obs.)						3.00	(4)
Retailers							
Easy to work with	0	0	4	2	1	3.57	-0.57
Fresh	1	4	1	1	0	2.29	0.71
Least Cost	1	1	1	4	0	3.14	-0.14
Locally Sourced	4	2	1	0	0	1.57	1.43
Other	1[d]	0	0	0	6	4.43	-1.43
Overall Average (# of obs.)						3.00	(7)

Notes:

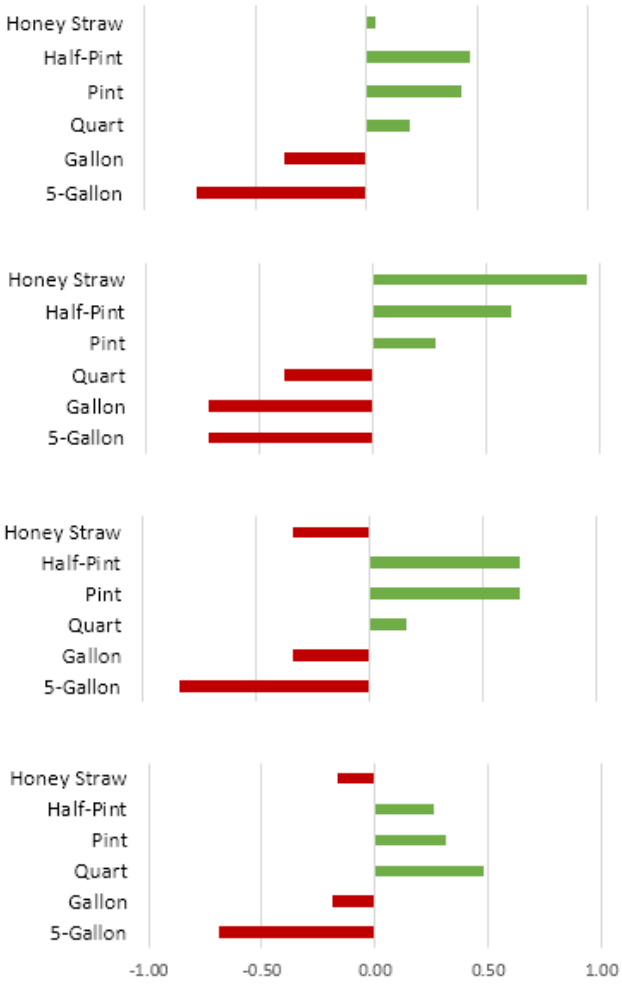
[a] 1 = Ranked Most Important … 5 = Ranked Least Important.

[b] Deviation from Average of Average Rank [c] Taste [d] Unique honey comb design

Figure 6. Description of Relative Preferences in Honey Package Size by Respondent Group

(Appendix C Section 5)

	# of Responses			Pack.	
All Responses (# of obs.)	**No**	**Maybe**	**Yes**	Avg[a]	Dev[b]
Honey Straw (13)	4	4	5	1.08	0.04
Half-Pint (14)	2	3	9	1.50	0.47
Pint (13)	2	3	8	1.46	0.43
Quart (13)	4	2	7	1.23	0.20
Gallon (12)	7	2	3	0.67	-0.37
5-Gallon (11)	9	1	1	0.27	-0.76
Overall Average[c]				1.03	
Brewers					
Honey Straw (3)	0	1	2	1.67	0.94
Half-Pint (3)	1	0	2	1.33	0.61
Pint (3)	1	1	1	1.00	0.28
Quart (3)	2	1	0	0.33	-0.39
Gallon (3)	3	0	0	0.00	-0.72
5-Gallon (3)	3	0	0	0.00	-0.72
Overall Average				0.72	
Growers					
Honey Straw (3)	1	1	1	1.00	-0.33
Half-Pint (4)	0	0	4	2.00	0.67
Pint (4)	0	0	4	2.00	0.67
Quart (4)	1	0	3	1.50	0.17
Gallon (3)	1	1	1	1.00	-0.33
5-Gallon (2)	1	1	0	0.50	-0.83
Overall Average				1.33	
Retailers					
Honey Straw (7)	3	2	2	0.86	-0.17
Half-Pint (7)	1	3	3	1.29	0.26
Pint (6)	1	2	3	1.33	0.31
Quart (6)	1	1	4	1.50	0.48
Gallon (6)	3	1	2	0.83	-0.19
5-Gallon (6)	5	0	1	0.33	-0.69
Overall Average				1.02	



Notes:

[a] No = 0, Maybe = 1, Yes = 2. Package average is weighted by number of responses obtained.

[b] Deviation from overall average. [c] Average of package size averages.

Figure 7. Number of Respondents that Prefer Certain Honey Container Sizes (Appendix C Section 5)

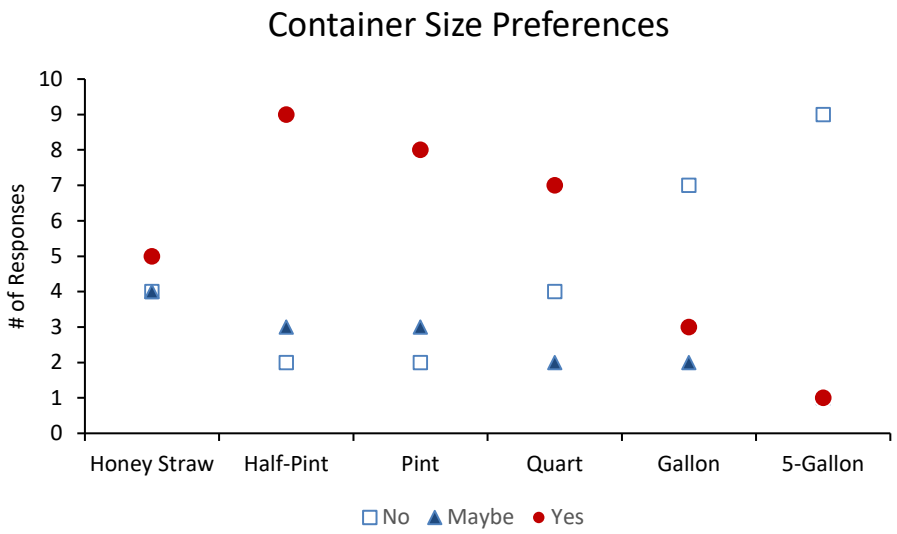
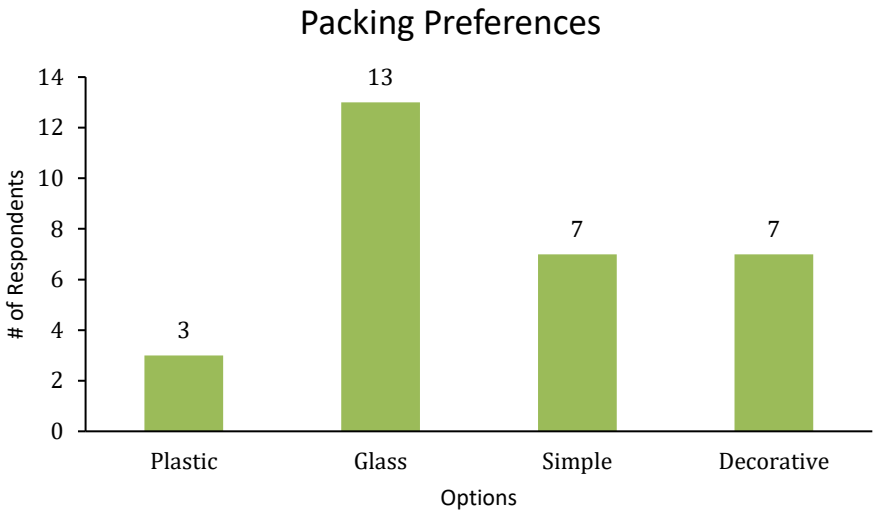


Figure 8. Number of Respondents That Preferred Specific Packaging Materials and Styles. (Appendix C Section 6)



Appendix A – Useful Websites

A brief description on how to get started as a beekeeper, specifically in Arkansas:

http://uaex.edu/farm-ranch/special-programs/beekeeping/getting-started.aspx

A summation of honey details, labeling requirements, and liquefying methods:

https://www.sciencedaily.com/releases/2017/02/170219165128.htm

Northwest Arkansas Beekeepers Association Website (includes general information):

http://www.nwabeekeepers.com/

General information for beginning beekeepers:

https://www.beethinking.com/pages/beekeeping-for-beginners

http://www.nationalhoneybeeday.com/startinginbeekeeping.html

Cost of beekeeping:

https://www.kelleybees.com/Blog/7/A-Bee-Cs/165/Thinking-About-Keeping-Bees-Part-1-Costs-Time-and-Intangibles

Bee supplies companies:

https://www.kelleybees.com/index.html

https://www.mannlakeltd.com/

http://www.brushymountainbeefarm.com/?gclid=CjwKEAjw8OLGBRCklJalqKHzjQ0SJACP4BHr0fI1tjBWGrTMsyDkYc-uFiUsbWBZMR7sg3P_CWaXcBoCiQPw_wcB

https://www.dadant.com/catalog/tools

https://www.honeyflow.com/?gclid=CjwKEAjw8OLGBRCklJalqKHzjQ0SJACP4BHrBv8tS4vJ_059Gz3XGPXYIYIRyEK9ycar67gBW8q7cxoCLezw_wcB

Appendix B – IRB Approval

UNIVERSITY OF ARKANSAS

Office of Research Compliance
Institutional Review Board

November 10, 2016

MEMORANDUM

TO:	Sam Goll Jennie Popp Donald Steinkraus Michael Popp
FROM:	Ro Windwalker IRB Coordinator
RE:	New Protocol Approval
IRB Protocol #:	16-10-178
Protocol Title:	*Putting Honey on the Table: A Business Plan to Create a Successful Part Time Beekeeping Operation*
Review Type:	☒ EXEMPT ☐ EXPEDITED ☐ FULL IRB
Approved Project Period:	Start Date: 11/10/2016 Expiration Date: 11/09/2017

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (https://vpred.uark.edu/units/rscp/index.php). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 40 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu.

Appendix C - Surveys

Survey 1 -- Brewers Survey

(Shaded Questions surrounded by a box were repeated in the Growers and Retailers Surveys)

Locally Sourced Honey Brewery Survey

Dear Brewery,

I am contacting you to get your opinions about local and sustainable food choices related to honey. I'm a honors undergraduate student and part time bee keeper and am hoping to get some information about your honey retailing strategies. I plan to use the collected information for my honor's thesis. The survey will take roughly 5 minutes and the information we collect will not be linked to individuals but rather reported in anonymous summary form.

So, please take 5 minutes out of your daily routine. The survey link from the e-mail you received keeps track of your responses using your computer IP address. **Please use the same computer.** You can leave and reenter the survey until you get to the last screen at which point your answer will be recorded. I will close the survey on Tuesday, **Nov. 22** at noon. I would really appreciate it if you would answer all questions as I am sending this survey to 10 people.

The goal is to get input on what you, as a retailer, value when selling locally grown products in your store. Does it matter to your customers and you how it was produced, who produces it and where it was produced?

Please use the Next or >> buttons to advance.

Please mark all services that your establishment offers.

- ☐ Restaurant
- ☐ Beer Brewing
- ☐ Wine Production
- ☐ Distilling
- ☐ Beer Tastings
- ☐ Wine Tastings
- ☐ Coffee Shop
- ☐ Merchandise Sales (T-shirts, hats, etc.)
- ☐ Non-Brewery Branded Products
- ☐ Other

Section 1

Do you currently sell honey bee products?

- ○ Yes
- ○ No

Would you like to carry honey bee products?

- ○ Yes
- ○ No
- ○ Maybe

How many suppliers of bee products do you have?

Would you like to have more suppliers of bee products?

- ○ Yes
- ○ No

Please indicate what products sell well or you think have market potential? Where applicable, please also indicate if you would like to sell the product or would like more of a product.

Section 2

	I think this product has market appeal						I carry this product and want more product supply		I don't carry this product but I want this product	
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Don't Know	Yes	No	Yes	No
Raw Honey 	○	○	○	○	○	○	○	○	○	○
Crop-specific Honey (Clover, Tupelo Tree, Blueberry, etc.)	○	○	○	○	○	○	○	○	○	○
Flavored Honey (Cinnamon, Ginger, etc.)	○	○	○	○	○	○	○	○	○	○
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Don't Know	Yes	No	Yes	No
Creamed Honey 	○	○	○	○	○	○	○	○	○	○
Honey Comb 	○	○	○	○	○	○	○	○	○	○
Honey Straws 	○	○	○	○	○	○	○	○	○	○

(Continued) Please indicate what products sell well or you think have market potential? Where applicable, please also indicate if you would like to sell the product or would like more. Section 3

	I think this product has market appeal						I carry this product and want more product choice		I don't carry this product but I want this product	
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Don't Know	Yes	No	Yes	No
Pure Beeswax 	O	O	O	O	O	O	O	O	O	O
Lip Balm	O	O	O	O	O	O	O	O	O	O
Pollen 	O	O	O	O	O	O	O	O	O	O
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Don't Know	Yes	No	Yes	No
Mead (Honey Beer)	O	O	O	O	O	O	O	O	O	O
Honey Wine	O	O	O	O	O	O	O	O	O	O
Honey Whiskey	O	O	O	O	O	O	O	O	O	O

What is the maximum distance from your store for a supplier to be considered local?

Miles

0 25 50 75 100 125 150 175 200 225 250

Please record your level of agreement with each of the following statements. Section 4

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Don't Know
It is important to me to source locally (as described above) if available	○	○	○	○	○	○
It is important to me that ingredients in my establishment are sourced within the US.	○	○	○	○	○	○
It is important to me that small to mid-sized farms in the supply region of this establishment get a fair chance to participate in this food supply chain.	○	○	○	○	○	○
I prefer to source branded products with at least regional name recognition	○	○	○	○	○	○

Please rank the following supplier attributes that would impact your choice of supplier.

Note: Rank from 1 = most important to 5 = least important. Drag and drop by grabbing an attribute (left click mouse) and rearranging the list.

As Fresh as Possible (e.g. no crystalization)

Is least cost

Easy to work with supplier (on time delivery, friendly, etc.)

Locally Sourced (as described above)

Other ... especially with respect to honey

Please indicate product and packaging preferences.

Section 5

	I want to carry this product			How often do you order?				
	Yes	No	Maybe	Weekly	Monthly	Quarterly	Seasonally	Don't carry
Half Pint 	○	○	○	○	○	○	○	○
Pint of Honey 	○	○	○	○	○	○	○	○
Quart of Honey 	○	○	○	○	○	○	○	○
Gallon of Honey 	○	○	○	○	○	○	○	○
5 Gallon of Honey 	○	○	○	○	○	○	○	○
Honey Straws/Sticks 	○	○	○	○	○	○	○	○

Depending on product what kind of packaging options do you prefer?
Mark all that apply:

Section 6

- [ ] Decorative (unique container or design on container)
- [ ] Simple/Plain (no design on container)
- [ ] Glass
- [ ] Plastic

If you would like to share additional information about your establishment or your demand for honey bee products, please enter below.

CAREFUL

You can only submit your responses once using the *same computer*.

If you need to return and edit, you can exit the survey by closing this browser window (in the top menu bar with the 'X'). Closing the browser will save your data. When you revisit the survey by again clicking on the survey link that was e-mailed to you from the *same computer*, your survey information will have been saved and kept. I would appreciate only one response.

If you are ready to submit your responses, please, click on the '>>' button at the bottom right. You will not get an e-mail confirmation but should receive a 'Thank You' message.

If the need arises, send me an e-mail if you experience difficulties.

Thank you for your time and submission!

Survey 2 -- Pollination Survey

Locally Sourced Honey Survey

Dear Producer,

I am contacting you to get your opinions about local and sustainable food choices related to honey. I'm a honors undergraduate student and part time bee keeper and am hoping to get some information about your needs for bee pollination services. I plan to use the collected information for my honor's thesis. The survey will take roughly 5 minutes and the information we collect will not be linked to individuals but rather reported in anonymous summary form.

So, please take 5 minutes out of your daily routine. The survey link from the e-mail you received keeps track of your responses using your computer IP address. **Please use the same computer.** You can leave and reenter the survey until you get to the last screen at which point your answer will be recorded. I will close the survey on Tuesday, **Nov. 22** at noon. I would really appreciate it if you would answer all questions as I am sending this survey to 10 people.

The goal is to get input on what you, as a producer in need of bee pollination serivces, value when contracting for this service.

Please use the Next or >> buttons to advance.

Mark all services that your establishment offers.

- ☐ Restaurant/Cafe
- ☐ Pick your own
- ☐ Juice Producion
- ☐ Picked Produce
- ☐ Guided Tours
- ☐ Canned Goods
- ☐ Merchandise Sales (T-shirts, hats, etc.)
- ☐ Products not produced on your farm
- ☐ Other

What products do you sell/produce?
Please mark all that apply

☐ Pumpkins	☐ Strawberries	☐ Plums
☐ Squash	☐ Blackberries	☐ Pears
☐ Gords	☐ Blueberries	☐ Peaches
☐ Zucchini	☐ Watermelon	☐ Pecans
☐ Tomatoes	☐ Cantaloupe	☐ Walnuts
☐ Onions	☐ Cherries	☐ Jams
☐ Grapes	☐ Apples	☐ Other

Do you have honey bees on your production site for pollination?

- ○ Yes
- ○ No

Would you like to have honey bees at your production site for pollination?

- ○ Yes
- ○ No

Would you prefer to use smaller, local beekeepers or larger, commercial beekeepers for pollination?

- ○ Local
- ○ Commercial
- ○ Does Not Matter

How many colonies of honey bees do you need for your opperation?

None	1-5	6-10	11-15	16-20	21 or more
○	○	○	○	○	○

Please also indicate if you have your own bees on your property by indicating how many colonies are your own (please indicate if you are contracting for this service)

None	I contract for pollination	I own 1-5	I own 6-10	I own 11-15	I own 16 -20	I own 21 or more
○	○	○	○	○	○	○

Sections 1-6 follow and are the same as shown for the "Brewers" survey.

Survey 3 -- Retail Survey

Locally Sourced Honey Retail Survey

Dear Retailer,

I am contacting you to get your opinions about local and sustainable food choices related to honey. I'm a honors undergraduate student and part time bee keeper and am hoping to get some information about your honey retailing strategies. I plan to use the collected information for my honor's thesis. The survey will take roughly 5 minutes and the information we collect will not be linked to individuals but rather reported in anonymous summary form.

So, please take 5 minutes out of your daily routine. The survey link from the e-mail you received keeps track of your responses using your computer IP address. **Please use the same computer.** You can leave and reenter the survey until you get to the last screen at which point your answer will be recorded. I will close the survey on Tuesday, **Nov. 22** at noon. I would really appreciate it if you would answer all questions as I am sending this survey to 20 people.

The goal is to get input on what you, as a retailer, value when selling locally grown products in your store. Does it matter to your customers and you how it was produced, who produces it and where it was produced?

Please use the Next or >> buttons to advance.

What style of retailer are you? (choose all that apply)

- ☐ Restaurant
- ☐ Grocery
- ☐ Coffee Shop
- ☐ Farmer's Market
- ☐ Other

Sections 1-6 follow and are the same as shown for the "Brewers" survey.