

# Hawaii Grass-fed Beef Quality Standards

*A Profile of Local Beef and Initial Framework for  
Grading Pasture-raised, Grass-fed Beef*



Submitted by the Hawaii Cattlemen's Council

Funded by the Department of Agriculture

June 30, 2020

## Table of Contents

Introduction.....	2
Beef Consumption in Hawaii.....	3
Beef Production in Hawaii .....	3
Methods .....	3
Results.....	4
Discussion.....	8
Literature Cited .....	13

## Introduction

The purpose of this project is to determine an initial framework for the quality standards to protect the integrity of Hawaii pasture-raised, grass-fed beef industry. The series of surveys is an initial audit and assessment of needs and is a critical first step in determining the basis for a grass-fed beef grading program.

There has been increasing consumer demand for locally raised food, including grass-fed beef. Few statistics are available, but this demand is reflected in increased retail shelf space, featured menu items and the popularity of local beef at farmer's markets. The difficult logistics and increasing costs of shipping livestock to the US mainland, the ability for some regions of Hawaii to maintain pasture year-round, and the increasing demand for local beef are some of the reasons for Hawaii's ranchers to raise beef to finish in Hawaii. Developing a quality standard for grass-fed beef can help to ensure a consistently, positive eating experience for the consumer and provides the potential for higher returns on higher quality grades of beef for the producer and processor.

USDA established guidelines for labeling "Grass-Fed Beef" in 2007 (USDA-AMS 2007). This label certifies that the meat produced was raised on forage from start to finish with no grain supplementation after being weaned from mother's milk. It also notes that the animals raised had continuous access to pasture. However, this label designation is often misused and confusing for the consumer, which is partly why the USDA-AMS process verified label was withdrawn in January 2016. There is however an approved label on the books under the Food Safety and Inspection Service (FSIS), that only attempts to address an animal's diet in the claim, leaving consumers in the dark regarding the end product quality or tenderness of the meat they purchase. For the purposes of this report, grass-fed refers to animals which are raised on forage from start to finish and have continuous access to pasture with no whole grain supplementation. The term "grass-fed", "grass-finished", "pasture-raised" and "pasture-finished" will refer to the same standard.

Currently the official quality grading standards (e.g. Prime, Choice and Select) developed and maintained by the USDA's Agricultural Marketing Service are tailored to younger, grain-finished beef animals, as it is based on maturity and the marbling or intramuscular fat that the beef carcass contains. In contrast, cattle developed solely on grass typically require more time to achieve their terminal endpoint and may be leaner overall with less marbling. This often results in grass-finished cattle being marketed between 24 and 36 months of age with lower marbling scores. Under the current framework, animals harvested at 30 months of age and older are heavily discounted, representing a major detriment to profitability for the majority of grass-fed carcasses marketed in Hawaii. Development of grass-finished standards may remedy this discrepancy in the marketplace and add value to ranchers and processors. At the present time, no standards exist for grass-finished beef marketing aside from a 'diet' or 'animal raising claim' limiting the opportunity for expansion.

This project has the potential to be impactful on a national standpoint as no other state has a grading system for grass-fed beef and the results of this project, as well as the potential quality standards, could become a national template. It is important to note that in order to add value across the supply chain, the grading system should be practical and not limited by expense to implement across the state.

### *Beef Consumption in Hawaii*

Per capita, annual consumption of beef in the United States is 57.2 pound. This means that residential beef demand is 81.2 million pounds. Visitor data recorded 9.9 million visitors to Hawaii in 2018 (*Annual Visitor Research Reports 2018*), who spent a total of 88.6 million visitor days in the islands. Visitor beef demand is 13.9 million pounds, bringing the total demand for beef in Hawaii to 95.1 million pounds.

The demand specifically for grass-fed beef is likely driven by the health benefits of leaner, grass-fed beef and a perception of a smaller environmental footprint from producing grass-fed beef as opposed to finishing on grain in a feedlot (McCluskey et al. 2005; Xue et al. 2010; Kim et al. 2016).

### *Beef Production in Hawaii*

While demand for local, grass-fed beef is on the rise, there are limitations to the production of beef in Hawaii, such as land availability, drought and quality of forage (Fukumoto et al. 2016). USDA NASS data shows that there was a slight increase in commercial cattle slaughter in the state of Hawaii from 1,046,000 pounds of live weight in 2018 to 1,090,000 pounds in 2019.

Considering the factors that lend to a quality grass-fed beef product are not found on all pasture, we acknowledge that there will always be a diversity in business models. While some ranches are able to increase their grass-fed herd and keep cattle in Hawaii for consumption, others will continue as cow-calf operations and send calves to the continental US for finishing. An assessment of Hawaii Island's potential pasture and rangeland determined that 210,368 acres of pasturelands (36.9%) were suitable areas for high quality production of grass-fed beef, based on elevation and rainfall. The remaining 360,294 acres of pasturelands (63.1%) did not have the best environmental conditions suited for grass-fed beef production and would be better used for cow-calf production (Fukumoto et al. 2016). These calves are raised in Hawaii, sent to a feedlot on the continental US and finished on grain. Currently, 20-30% of calves are kept in the state to be locally raised for consumption (Kim et al., 2016).

## Methods

We surveyed industry stakeholders to guide the development of a framework for future standards that the cattle industry in Hawaii may adopt. The survey focused on the three major segments of the local beef industry: producers, processors and consumers.

**Producers:** A questionnaire was created to solicit information about operational decision-making, cattle/product marketing and strategies for the local beef market. A total of 17 questions were asked, some with sub-questions. The instrument was created and content validated by the 2019 LOCALBEEF project partners and survey formatting was validated by Sandlin Consulting. Cattlemen were approached at the Hawai'i Cattlemen's Convention (November 2019) and could complete a paper or online of the questionnaire. After Convention, the online version of the questionnaire was sent to potential respondents via email. Producers were also approached with a paper version of the instrument during scheduled travel/events by members of the project advisory committee.

There was a total of 44 instruments completed. The data were analyzed using descriptive and inferential statistics and qualitative data analysis techniques, as the data warranted.

**Processors:** A questionnaire was created to solicit information about purchasing and selling decisions and content, operational understanding of processing and marketing terms, participation in marketing programs and perceptions of the local pasture raised beef industry. A total of 42 questions were asked. The instrument was created and content validated by the 2019 LOCALBEEF project partners and survey formatting was validated by Sandlin Consulting. The instrument was created in an online surveying software and the Managing Director of Hawaii Cattlemen's Council (HCC) sent the link to all beef processors (~10) in Hawaii via email. After an extensive response reminder and deadline extension process, a total of 6 instruments were submitted. The data were analyzed using descriptive statistics and qualitative data analysis techniques (constant comparative method), as the data warranted.

**Consumers:** An online survey was conducted through Qualtrics research services. The instrument was created and content validated by the 2019 LOCALBEEF project partners and survey formatting was validated by Sandlin Consulting and the assigned project manager at Qualtrics. The survey solicited information about frequency of beef consumption, purchasing habits, beef attributes and general preference as it relates to pasture-raised, grass-fed beef. A total of 18 questions were asked; some with sub-questions. Qualtrics recruited panelists and disseminated the survey to 46 Hawaii residents as a soft-launch to test the survey. Once the survey was corrected for any issues, Qualtrics relaunched the survey. Of the completed 630 questionnaires, approximately 75 responses were considered "bad" responses and were removed and resampled. A final total of 610 questionnaires were completed. Responses were solicited in such a way as to get a representative sample of the Hawaii population in terms of age categorization and gender. The data were analyzed using descriptive and inferential statistics and qualitative data analysis techniques, as the data warranted.

## Results

The complete results of the survey are attached as Appendix 1. Highlights from each section are listed below.

### Producers

- As the majority of Hawaii cattle are marketed through conventional feedyards, this will need to remain a viable option for our producers.
- 30% of producers do not use mineral supplementation for their herds.
- Producers surveyed had strong interest, 84.1%, in increasing number of animals marketed locally and over half of those surveyed, 58.14% expect to increase herd size in the next 5 years.
- Producers listed incentives for marketing more local product as increased returns, access to local markets and interest in serving the local community (Table 1).

Table 1		
<i>Which of the following would be incentive(s) for you to market more of your cattle locally? (Select all that apply)</i>		
Item	<i>f</i>	<i>%</i>
Increased returns	30	29.41
Access to local markets	26	25.49
Interest in serving the local community	18	17.65
Interest in food security	11	10.78
Animal welfare	10	9.80
Other <sup>a</sup>	7	6.86
<i>Note:</i> Table organized descending percentage order. Total percentage may not equal 100 due to rounding.		
<sup>a</sup> Other_Text: Availability of county/state leased lands; Better price; Increase acreage (2); Increased processing opportunities; profit margin		

- Producers listed limited acreage, limited markets, drought and access to processors as barriers to local marketing.
- For those who participate in local branded beef programs, current specifications include that they be grass-fed, naturally, locally raised and antibiotic free (Table 2).

Table 2		
<i>For those who participate in a branded beef program, what are the specifications of the program(s)? (Select all that apply)</i>		
Item	<i>f</i>	<i>%</i>
Grass Fed/Grass Finished	17	25.00
Natural	11	16.18
Locally raised	10	14.71
Antibiotic free	8	11.76
Weight	7	10.29
Animal Welfare Certified	5	7.35
Size	4	5.88
Breed	3	4.41
Source verified	3	4.41
<i>Note:</i> Table organized descending percentage order. Total percentage may not equal 100 due to rounding.		

- Producers that sort/grade their animals currently use;
  - Age
  - Visual appraisal
  - Weight

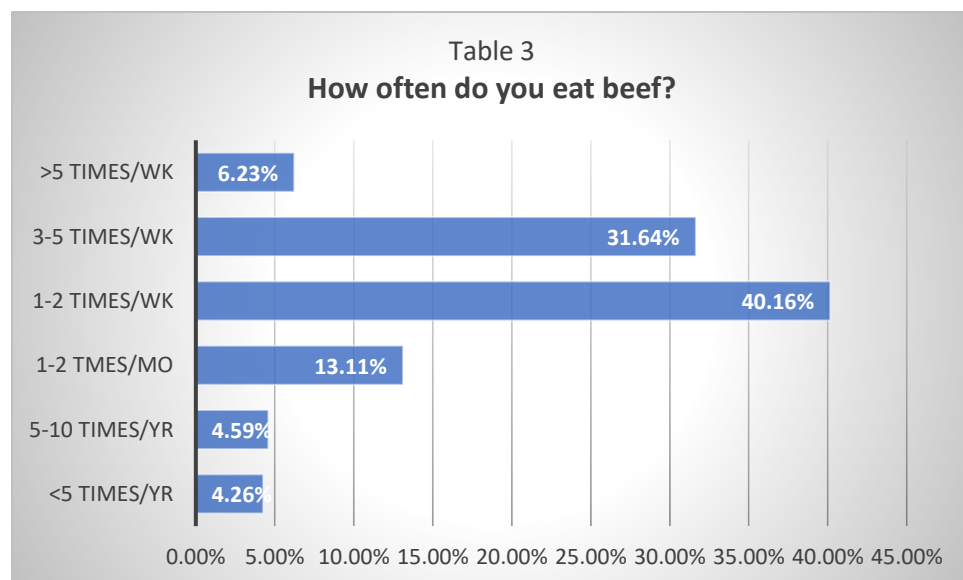
- Most important production factors to producers include;
  - Genetics
  - Age
  - Type of pasture
- The large majority of producers believe there is variability in local beef products and think it is very important to establish a standardized method for evaluating local beef products.

### Processors

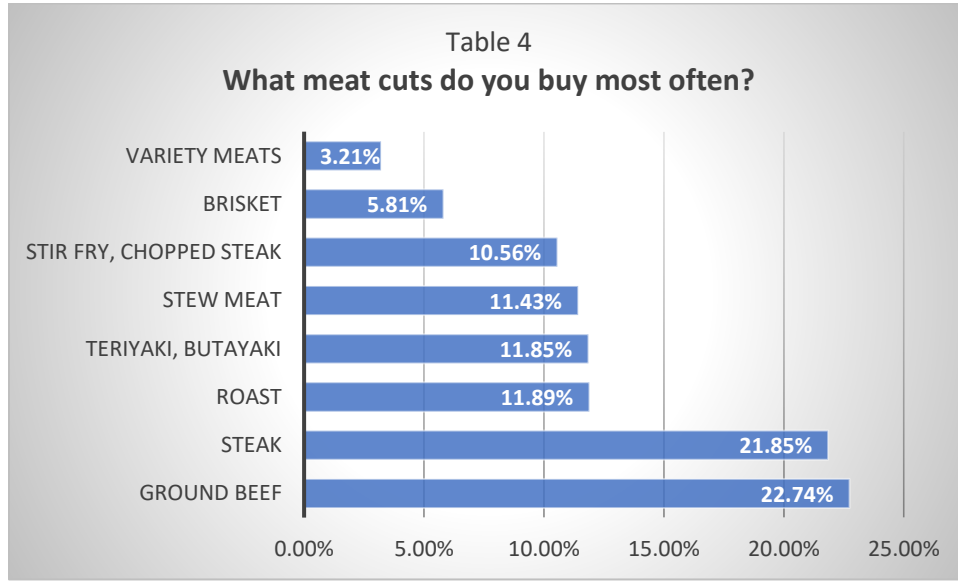
- Processors have a broad understanding of food safety.
- The most important attributes of pasture-raised beef to processors are;
  - How and where cattle are raised
  - Animal well-being
  - Weight and size
  - Eating satisfaction
- Processors are familiar with local branding programs.
- Processors believe one of the greatest strengths of pasture raised beef is demand.
- Processors listed product quality and specifications as the greatest weaknesses of pasture-raised beef.
- Processors believe pasture raised beef will be threatened by limited availability of grazing lands and cost.
- Processors think establishing a standardized method for grading local beef is very important.

### Consumers

- Beef ranked #1 when consumers were asked their preference for protein. This was followed by poultry, fish and pork.
- The large majority of consumers surveyed (78%) eat beef at least 1-2 times per week (Table 3). In addition, consumer perception of local ranchers is positive regarding food production, environmental stewardship and animal welfare.
- The most common beef cuts are ground beef, steaks and roasts (Table 4).







- The most important factors driving beef purchase are;
  - Price
  - Quality
  - Cut
- All other factors being equal, consumers prefer local, grass-finished beef. This is an indication of preference not a reflection of purchasing activity.
- The majority of consumers (92.62%) say that local beef consistently satisfies their expectation for a desirable eating experience.
- Consumers report food safety to be a very important attribute of local pasture-raised beef.
- 80.16% of consumers say a quality grade would help drive their decision making.





## Discussion

### Initial Framework for Grass-fed Beef Grading Standards

Meat quality has traditionally focused on the intrinsic value of the product itself, its flavor and tenderness. More recently, the marketplace has become a place where consumers also express their social values. Consumers want to be sure their purchasing decisions align with their moral values. So, in addition to palatability, the quality of meat or any product can also be measured by its extrinsic value - by the way it reflects a consumer's social beliefs (Berri et al, 2019).

A label must add value for the producer and processor and needs to appeal to both the intrinsic and extrinsic factors that consumers are seeking. Our survey notes consumers are looking for a trusted label that helps them make an informed buying decision. While Hawaii consumers are currently satisfied with local pasture-raised beef, it is important to preserve that impression. Other researchers (Van Elswyk and McNeill, 2014) have found grass-fed beef to be inconsistent in palatability leading to consumer dissatisfaction.

A label for Hawaii Pasture-Raised, Grass-fed beef should consider the following;

#### ***Eating quality – palatability, intrinsic value***

- It has been previously demonstrated that traditional USDA quality grading alone is not a good indicator of meat tenderness of forage-finished cattle, likely due to a much lower amount of intramuscular fat. (Kim et al, 2007).
- Shear force testing has been used to demonstrate tenderness of beef. The USDA Certified Tender label allows for marketing claims for tenderness through third party certification of unenhanced meat based on shear force alone. (ASTM. Designation: F2925 – 11). However, this method does not address animal factors such as age, breed type or genetics which have been shown to be correlated with tenderness. (Kim et al, 2016, Gardner et al, 1995, Lozano et al, 2015).
- Color and multispectral image texture features have also been associated with tenderness (Guzek et al, 2013, Rust et al, 2008, Sun et al, 2012, Wulf et al, 1997). These objective measures help to provide a more consistent product for the consumer to enjoy. This consistency can help to drive demand and sustainability.
- Researchers at Purdue University recently concluded that dry-aging of grass-fed beef loins could improve the eating quality attributes of low-marbled grass-fed beef without adversely affecting microbial characteristics (Berger et al, 2018).
- Recent work at the University of Hawai'i has demonstrated the effectiveness of genetic markers to improve the marbling, tenderness and carcass yield traits in steers and heifers reared in grass-fed programs (Caires, 2019).
- Multiple effective post-harvest interventions exist for the improvement of beef tenderness, including electrical stimulation, Tendercut, and postmortem aging (Smith et al., 2008), which could be incorporated into a grading standard and/or branded program.
- Novel technologies that utilize metabolomic approaches to determine the composition of meat in real time have shown promise to differentiate tough from tender beef in combination with the ability to differentiate flavor profiles, including grass fed beef (Gredell et al., 2019). Perhaps the greatest challenge with grass fed beef is the variation that exists in flavor performance, and an ideal grading system should address beef flavor.

Hawai'i's beef industry may benefit from taking a unique approach to quality grading that may include animal factors, objective measures, post-harvest techniques and new technologies.

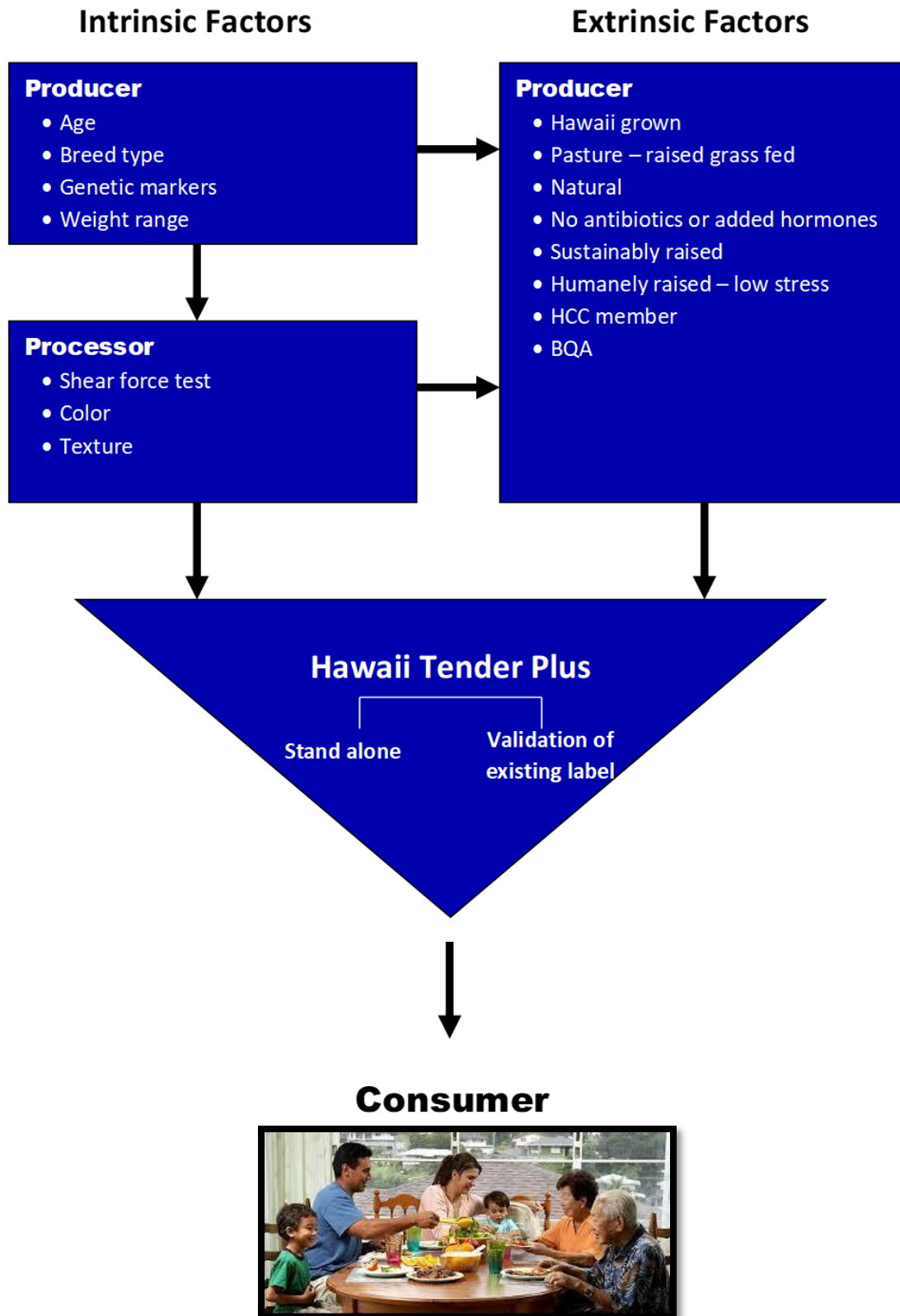
### ***Production factors – extrinsic value***

- These are attributes that describe the way in which the animals are raised but do not necessarily translate directly to the eating quality of the product. These factors contribute to the extrinsic value of the product and as indicated in the survey, are important to the consumer and are likely to add value. Researchers have observed a consumer willingness to pay a premium on grass-fed beef based on health benefits (McCluskey et al., 2005)
- The beauty of these factors is that most Hawai'i ranchers are already incorporating these attributes into their production system. Labeling allows the producer to highlight the good work they are already doing. Many of these factors, as defined by Food Safety and Inspection Service, relate to how and where the animals are raised. Below are some to be considered.
  - pasture-raised, grass-fed
  - natural
  - no antibiotics
  - no hormones
  - Hawaii-grown
  - sustainably raised
  - humanely raised, Beef Quality Assurance (BQA), third party certification
  - Hawaii Cattlemen's Council member/endorsed

### ***Preservation of existing labels***

- If a new label is proposed, it should not detract or compete with any currently labeled products. It may be an additional endorsement of a product or a stand-alone label. This label may be newly created by the HCC or Hawaii Department of Agriculture (DOA), or it may use current labels such as the DOA's Seal of Quality or Made in Hawaii with Aloha brands.
- Additionally, the label should be applicable and accessible to all processors state-wide. Implementation should ideally be real-time, line speed and economical.

A concept for the label is presented below (Chart 1).



### ***Recommendations for further work***

#### **❖ Establish markers for eating quality of Hawaii's pasture-raised, grass-fed beef considering;**

- Animal characteristics such as;
  - Age
  - Breed type
  - Genetic markers
  - Optimal weight range
- Objective measures such as;
  - Shear force test
  - Lean and fat color
  - Multispectral image texture features
  - Fat thickness
  - pH
  - Intramuscular fat (marbling)
  - Metabolomic indicators of tenderness and flavor
- Standardized aging



#### **❖ Local ground beef project**

Identified in the survey as the most popular beef product purchased, this may be an ideal place to begin labeling. Kentucky Cattlemen's Association (KCA) recently launched their own ground beef label by setting up a separate limited liability corporation.  
(<https://www.kentuckycattlemensbeef.com/faq.html>)

In December 2019, KCA announced they had reached one million dollars in farm gate sales.  
<https://www.kentuckycattlemensbeef.com/news.html>

According to National Monthly Grass Fed Beef Report, June 26, 2020, wholesale 90% ground beef averaged \$8.78/lb. compared to conventional 90% ground beef at \$4.65/lb retail (USDA National Report, Beef, June 19-25, 2020). While these prices are not a direct reflection of Hawaii's markets, they do demonstrate the market potential.

By following a similar model, Hawaii's producers may be able to capitalize on the popularity of local grass-fed ground beef. Criteria for the product may include animal characteristics, production methods and limited added imported trim.

#### **❖ Nutritional supplementation**

As a byproduct, these surveys identified needs that can be met through education or trainings that will improve the beef that reaches consumers. For example, 30% of producers surveyed do not use any mineral supplements. As Hawai'i grasses are known to have mineral deficiencies, there is an opportunity to improve on production by providing educational information on supplementation.

### ❖ **Consideration of a new industry segment.**

Our study identified that both producers and processors view availability of pasture as one of the biggest limitations to a grass-fed program. If grass-fed beef is to expand, producers will either need to expand existing lands to allow for the longer grazing needed to finish grass-fed animals, limit herd size to allow for expansion into a grass-fed program, partner with a stocker-finisher who grows out cattle to finish or develop the local capacity to grow and harvest forage, hay and silage crops for supplemental feeding of grass-fed cattle operations.

Hawaii has traditionally been a cow-calf state and this model would allow for a new segments of the industry to develop.

Additionally, Hawai'i's producers will need to work with private and public landowners to secure long-term, stable access to pasturelands.

## Acknowledgements

We thank the Hawaii Department of Agriculture for funding this project. We also thank Dr. Lisa Wood, Dr. M'Randa Sandlin, Dr. Kyle Caires, Dr. Keith Belk and Dr. Dale Woerner for their extensive contributions to this project. This project could not have been completed without the participants of our surveys providing valuable information.





## Literature Cited

- Agricultural Marketing Service Livestock, Poultry & Grain Market News, National Monthly Grass Fed Beef Report for the Month of June. June 26, 2020.
- Annual Visitor Research Reports*. Hawaii Tourism Authority. Retrieved June 2, 2020, from <http://www.hawaiitourismauthority.org/research/annual-visitor-research-reports/>
- ASTM International Standards. Standard Specification for Tenderness Marketing Claims Associated with Meat Cuts Derived from Beef. Designation: F2925 – 11
- Berger, J. (2018). Dry-Aging Improves Meat Quality Attributes of Grass-Fed Beef Loins. *Meat Science* 145: 285–291. Web.
- Berri, C., Picard, B., Lebret, B., Andueza, D., Lefèvre, F., Le Bihan-Duval, E., Beauchercq, S., Chartrin, P., Vautier, A., Legrand, I., & Hocquette, J.-F. (2019). Predicting the Quality of Meat: Myth or Reality? *Foods*, 8(10), 436. <https://doi.org/10.3390/foods8100436>
- Cafferky, J., Hamill, R. M., Allen, P., O'Doherty, J. V., Cromie, A., & Sweeney, T. (2019). Effect of Breed and Gender on Meat Quality of M. longissimus thoracis et lumborum Muscle from Crossbred Beef Bulls and Steers. *Foods* (Basel, Switzerland), 8(5), 173. <https://doi.org/10.3390/foods8050173>
- Caires, K. (2019). Use of Genomics Technologies to Facilitate Rapid Genetic Improvement of Economically Relevant Traits (ERTs) for Beef Cattle Production in Hawai'i Conference Paper. AGadaptation: Hawai'i's Growing Opportunity, Hawai'i Agriculture Conference Honolulu, HI..
- Fukumoto, G. K., Thorne, M. S., Silva, J. H., Deenik, J. L., & Stevenson, M. H. (2016). Suitability Map for Forage-Finished Beef Production Using GIS Technology: Kaua'i Island. 6.
- Gredell, Devin A., Amelia R Schroeder, Keith E. Belk, Corey D. Broeckling, Adam L. Heuberger, Soo-Young Kim, D. Andy King, Steven D. Shackelford, Julia L. Sharp, Tommy L. Wheeler, Dale R. Woerner, and Jessica E. Prenni. (2019). Comparison of Machine Learning Algorithms for Predictive Modeling of Beef Attributes Using Rapid Evaporative Ionization Mass Spectrometry (REIMS) Data. *Scientific Reports*. volume 9, Article number: 5721. <https://doi.org/10.1038/s41598-019-40927-6>.
- Guzek D, Głabska D, Pogorzelska E, Pogorzelski G, Wierzbicka A. (2013). Instrumental Textur Measurement of Meat in a Laboratory Research and on a Production Line. *Advances in Science and Technology Research Journal*. 7(19):5-11. doi:10.5604/20804075.1062329.
- Kim, Y. Soo, Fukumoto, G., Stevenson, M., Thorne, M., & Jha, R. (2016). Carcass traits and tenderness of grass-fed beef from subtropical pastures in Hawaii.
- Kim, Stevenson, Fukumoto, Thorne. (2016). Carcass traits and tenderness of grass-fed beef from subtropical pastures in Hawaii Conference Paper. Conference: 17th AAAP Animal Science Congress, At Fukuoka, Japan, Volume: pp. 1525-1529
- McCluskey, J. J., Wahl, T. I., Li, Q., & Wandschneider, P. R. (2005). U.S. Grass-Fed Beef: Marketing Health Benefits. *Journal of Food Distribution Research*. <https://doi.org/10.22004/ag.econ.27758>

- Robbins, K., Jensen, J., Ryan, K. J., Homco-Ryan, C., McKeith, F. K., & Brewer, M. S. (2003). Consumer attitudes towards beef and acceptability of enhanced beef. *Meat Science*, 65(2), 721–729. [https://doi.org/10.1016/S0309-1740\(02\)00274-7](https://doi.org/10.1016/S0309-1740(02)00274-7)
- Rubio Lozano, María Salud et al. (2016). Meat Tenderness Genetic and Genomic Variation Sources in Commercial Beef Cattle. *Journal of Food Quality* 39.2 : 150–156. Web.
- Rust, S R et al. (2008). Predicting Beef Tenderness Using Near-Infrared Spectroscopy. *Journal of animal science* 86.1: 211–219. Web.
- S Smith, G.C., K.E. Belk, J.D. Tatum, and J.A Scanga. (2008). Post-Harvest Practices for Enhancing Beef Tenderness. National Cattlemen’s Beef Association. Available at: [www.beefresearch.org](http://www.beefresearch.org)
- Sun, X et al. 2012. Predicting Beef Tenderness Using Color and Multispectral Image Texture Features. *Meat Science* 92.4: 386–393. Web.
- Umberger, W. J., Feuz, D. M., Calkins, C. R., & Killinger-Mann, K. (2002). U.S. consumer preference and willingness-to-pay for domestic corn-fed beef versus international grass-fed beef measured through an experimental auction. *Agribusiness*, 18(4), 491–504. <https://doi.org/10.1002/agr.10034>
- United States Department of Agriculture, Food Safety and Inspection Service, Meat and Poultry Labeling Terms. <https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/food-labeling/meat-and-poultry-labeling-terms/meat-and-poultry-labeling-terms>
- USDA, National Retail Report, Beef, Advertised Prices for Beef at Major Retail Supermarket Outlets ending during the period of June 26 - July 2, 2020, Friday, June 26, 2020.
- Van Elswyk, Mary E, and Shalene H Mcneill. (2014). Impact of Grass/forage Feeding Versus Grain Finishing on Beef Nutrients and Sensory Quality: The U.S. Experience. *Meat Science* 96.1 (2014): 535–540. Web
- Wulf, Duane et al. (1997). Using Objective Measures of Muscle Color to Predict Beef Longissimus Tenderness. *Journal of Animal Science* 75.3 : 684–92. Web.
- Xue, H., Mainville, D., You, W., & Nayga, R. M. (2010). Consumer preferences and willingness to pay for grass-fed beef: Empirical evidence from in-store experiments. *Food Quality and Preference*, 21(7), 857–866. <https://doi.org/10.1016/j.foodqual.2010.05.004>



## Appendix 1. Survey Campaign Report

## **Survey Campaign Report**

### **2019 LOCALBEEF Study**

**Prepared by:**  
M'Randa R. Sandlin, Ph.D.  
Sandlin Consulting

## Table of Contents

Methods Summary .....	2
Processor Survey Data Report .....	3
Descriptive Statistics.....	4
Producer Survey Data Report .....	15
Descriptive Statistics.....	16
Inferential Statistics .....	22
Consumer Survey Data Report .....	24
Descriptive Statistics.....	25
Inferential Statistics .....	38
Appendix A-Processor Questionnaire.....	42
Appendix B-Producer Questionnaire.....	67
Appendix C-Consumer Questionnaire.....	78

## Methods Summary

The purpose of this study was to determine an initial framework for the quality standards to protect the integrity of Hawaii pasture-raised, grass-fed beef. To accomplish this purpose, a three-part survey campaign was used to collect data. The survey campaign focused on the three major segments of the local beef industry: processors, producers (ranchers), and consumers.

### Processors

A questionnaire was created to solicit information about purchasing and selling decisions and content; operational understanding of processing and marketing terms; participating in marketing programs; and perceptions of the local pasture raised beef industry. A total of 42 questions were asked. The instrument was created and content validated by the 2019 LOCALBEEF project partners and survey formatting was validated by Sandlin Consulting. The instrument was created in an online surveying software and the Managing Director of Hawaii Cattlemen's Council sent the link to all beef processors (~10) in Hawaii via email. After an extensive response reminder and deadline extension process, a total of 6 instruments were submitted. The data were analyzed using descriptive statistics and qualitative data analysis techniques (constant comparative method), as the data warranted.

### Producers

A questionnaire was created to solicit information about operational decision-making; cattle/product marketing; and strategies for the local beef market. A total of 17 questions were asked; some with sub-questions. The instrument was created and content validated by the 2019 LOCALBEEF project partners and survey formatting was validated by Sandlin Consulting. Cattlemen were approached at the Hawai'i Cattlemen's Convention (November 2019) and could complete a paper or online of the questionnaire. After Convention, the online version of the questionnaire was sent to potential respondents via email. Producers were also approached with a paper version of the instrument during scheduled travel/events by people on the project advisory committee. There was a total of 44 instruments completed. The data were analyzed using descriptive and inferential statistics and qualitative data analysis techniques, as the data warranted.

### Consumers

An online survey was conducted through Qualtrics research services. The instrument was created and content validated by the 2019 LOCALBEEF project partners and survey formatting was validated by Sandlin Consulting and the assigned project manager at Qualtrics. The survey solicited information about frequency of beef consumption, purchasing habits, beef attributes, and general preference as it relates to pasture-raised, grass-fed beef. A total of 18 questions were asked; some with sub-questions. Qualtrics recruited panelist and disseminated the survey to 46 Hawaii residents as a soft-launch to test the survey. Once the survey was corrected for any issues, Qualtrics relaunched the survey. Of the completed 630 questionnaires, approximately 75 responses were considered "bad" responses and were removed and resampled. A final total of 610 questionnaires were completed. Responses were solicited in such a way as to get a representative sample of the Hawaii population in terms of age categorization and gender. The data were analyzed using descriptive and inferential statistics and qualitative data analysis techniques, as the data warranted.

# **Processor Survey Data Report**

## Processor Survey-Descriptive Statistics

(N = 6)

- Because of the small response number, I did not include graphs in this section. Graphs with small response numbers tend to make the data appear exaggerated.
- The type of data collected does not allow for analysis beyond descriptive statistics.

Table S1

*What do you sell?  
(Select all that apply)*

Item	<i>f</i>	<i>%</i>
Beef subprimals	5	17.86
Portioned steaks/roasts	5	17.86
Beef trimmings for further processing	4	14.29
Case ready items	4	14.29
Beef variety meats/offal	4	14.29
Beef carcasses	4	14.29
Other	2	7.14

*Note:* <sup>a</sup>Other\_Text: Pork and chicken box in box out; Slaughter Services

Table S2

*Has your company purchased imported cattle or beef  
products (US or foreign) in the last 5 years?*

Item	<i>f</i>	<i>%</i>
No	4	66.67
Yes	2	33.33

Table S3

*Which country was it purchased from?  
(Select all that apply)*

Item	<i>f</i>	<i>%</i>
US Mainland	2	66.67
New Zealand	1	33.33

Table S4

*Please indicate the volume of each type of beef product that your company/organization currently brings in per month:  
(Please respond in the units indicated on each item)*

Item
Live cattle (# of head)
• 50
• 400-450
• 350
• 14-16
Beef subprimals (lbs)
• 500
Beef trimmings for further processing (lbs)
• 1000
Beef carcasses (lbs of carcasses)
• 22,000

Table S5

*What does the term “weight and size” mean to your company/organization?  
(Select all that apply)*

Item	<i>f</i>	%
Carcass weights	5	41.67
Uniformity in cattle	4	33.33
Appropriate ribeye size	2	16.67
Other <sup>a</sup>	1	8.33
Uniformity in cuts	0	0.00
Box weight	0	0.00

Note: <sup>a</sup>Other\_Text: Age

*Provide any explanation about your “weight and size” responses here:*

- Weight is determined as dressed weight on scale
- We like cattle with more muscle for better primal cuts
- Dress weight divided into the live weight gives your yield
- We currently buy cattle, pay on the rail weights
- We are processing cattle to package and ship to Molokai Livestock Coop. MLC requests certain needs - grass finished, cull cows, etc. We solicit producers to meet this request. We will do a visual appraisal of the live cattle or talk to the producer to determine if the cattle are truly grass "finished" and will grade out well for MLC. We try to educate the producer on what to look for in a live animal that will grade well as a carcass



Table S6

*What does the term “cattle genetics” mean to your company/organization?  
(Select all that apply)*

Item	<i>f</i>	%
Quality genetics	4	44.44
Genetic potential for marbling	2	22.22
Other <sup>a</sup>	2	22.22
EPD's	1	11.11
Angus	0	0.00
Predominantly black hided	0	0.00
Genetic testing/genetic markers	0	0.00

*Note:* <sup>a</sup>Other\_Text: Tender cattle; Genetic potential for carcass qualities

*Provide any explanation about your “cattle genetics” responses here:*

- Cattle that can generate a higher percentage of retail yield
- Cattle that have good genetics give you tenderness, good yields, and finishes faster keeping age below 30 months
- We try to track the good cattle to be able to pay the Rancher for the good cattle. Yield and quality.
- It is not only marbling, it is ribeye size and YG that make up carcass qualities. Genetics can be a big factor in getting high carcass quality in an under 30 month animal

Table S7

*What does the term “visual characteristics” mean to your company/organization?  
(Select all that apply)*

Item	<i>f</i>	%
Muscling	3	18.75
Amount of marbling	3	18.75
Phenotypic attributes	2	12.50
Lean/trimmed product	2	12.50
Appropriate product color	2	12.50
No defects	2	12.50
Other <sup>a</sup>	2	12.50

*Note:* <sup>a</sup>Other\_Text: You can see how well a carcass is finished. Underfinshished is when it lacks fat coverage. Over finish is when it's overly fat; Tender cattle.

*Provide any explanation about your “visual characteristics” responses here:*

- Visually in live cattle you can observe their temperament. It's the come in wild, the meat quality will be poor. If animals come in quiet meat quality will be of quality.
- High yielding well muscled cattle
- On live cattle we look for body score Rail cattle we look for quality and yield

Table S8

*What does the term “food safety” mean to your company/organization?  
(Select all that apply)*

Item	<i>f</i>	%
Pathogen testing	5	18.52
Products/materials produced in effective food safety environment	5	18.52
No detectable E. Coli	5	18.52
Hazard Analysis Critical Control Point (HACCP) Plan	5	18.52
No residues	4	14.81
Products/materials come from cattle that have pre-harvest intervention in place	2	7.41
Cooked to proper endpoint temperature	1	3.70

*Provide any explanation about your “food safety” responses here:*

- We are a USDA inspected facility and we comply with all regulations.
- No contamination that puts customers at risk
- We are the only BRC certified plant in Hawaii our standards for food safety is of the highest.
- USDA requirements, GMP, BRC, SQF certifications

Table S9

*What does the term “lean, fat, and bone” mean to your company/organization?  
(Select all that apply)*

Item	<i>f</i>	%
Lean to fat ratio	4	21.05
Adequate muscling	4	21.05
Carcass weight and size	3	15.79
Genetics	3	15.79
Quality grade	2	10.53
Yield grade 2’s and 3’s	2	10.53
Bone/structure	1	5.26

*Provide any explanation about your “lean, fat, and bone” responses here:*

- Higher yielding cattle
- It’s all about the yield and quality

Table S10

*What does the term “eating satisfaction” mean to your company/organization?  
(Select all that apply)*

Item	<i>f</i>	%
Tenderness	5	22.73
Flavor	5	22.73
Customer satisfaction	4	18.18
Juiciness	4	18.18
Overall palatability	3	13.64
Marbling	1	4.55

*Provide any explanation about your “eating satisfaction” responses here:*

- Tender product
- A Product that is very tasty and mouth watering, wanting to come back again to great experience
- Matching the product to the customer is most important

Table S11

*What does the term “traceability” mean to your company/organization?  
(Select all that apply)*

Item	<i>f</i>	%
Age and source verified	5	25.00
Ability to trace to ranch	5	25.00
Ability to trace outbreaks	4	20.00
Ability to investigate issues	4	20.00
Farm to fork	2	10.00

*Provide any explanation about your “traceability” responses here:*

- Be able to trace back to ranch
- Knowing where our beef comes from, From birth all the way to your table
- It’s just what’s going to be expected in the food industry. I think Hawaii is a great place to do this.

Table S12

*What does the term “sustainability” mean to your company/organization?  
(Select all that apply)*

Item	<i>f</i>	%
Using practices to keep current and future generations in business	5	25.00
Sound business practices	4	20.00
Triple bottom line: environmentally conscious, socially responsible, economically viable	3	15.00
Products are received from sustainable suppliers	3	15.00
Environmentally friendly	2	10.00
Being mindful of replenishing herd size	2	10.00
Sustainability is a plus but we don't have a policy for it in place	1	5.00

*Provide any explanation about your “sustainability” responses here:*

- The next generation
- Everyone talks a good story but they practice it, do they still think beef comes from a box
- Profitable, also needs to be a model that has replenishment in mind

Table S13

*What does the term “animal well-being” mean to your company/organization?  
(Select all that apply)*

Item	<i>f</i>	%
Animal handling	5	25.00
Animal welfare	5	25.00
Animal comfort	4	20.00
Animals are safe and have been provided with adequate nutrition	4	20.00
Built-in characteristics of the product	1	5.00
Antibiotic use	1	5.00

*Provide any explanation about your “animal well-being” responses here:*

- Low stress handling of cattle
- From the time an animal is born till they are harvested they should not be treated in a undesirable way.
- practice that keeps animal health and comfort top of mind

Table S14

*Which of the following attributes of pasture raised beef are most important to your company/organization?  
(Rank only your top 5 with 1 = Most Important)*

Item	<i>M</i>	<i>SD</i>	<i>Rank 1</i>		<i>Rank 2</i>		<i>Rank 3</i>		<i>Rank 4</i>		<i>Rank 5</i>	
			<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Weight/size (3)	3.33	1.25			1	33.33	1	33.33			1	33.33
Cattle genetics	1.00	0.00	1	100.00								
Visual characteristics	4.00	0.00							2	100.00		
Food safety	3.00	0.00					1	100.00				
Lean, fat, and bone (5)	3.00	1.00			1	50.00			1	50.00		
Eating satisfaction (4)	3.00	1.63	1	33.33			1	33.33			1	33.33
Traceability	5.00	0.00									1	100.00
Animal well-being (2)	2.00	0.00			2	100.00						
How and where the cattle are raised (1)	2.25	1.30	2	50.00			1	25.00	1	25.00		
Other <sup>a</sup>	5.00	0.00									1	100.00

*Note.* Table organized in Item order, as presented on the survey. The numbers in parentheses reflect the rankings as determined by a combination of choice count, mean, and standard deviation.

<sup>a</sup>Other\_Text: Third party verification

Table S15

*Does your company participate in, buy or sell branded beef products/programs?*

Item	<i>f</i>	%
Yes	3	60.00
No	2	40.00

Table S16

*What scale of branded beef programs do you participate in?(Select all that apply)*

Item	<i>f</i>	%
Local <sup>a</sup>	3	60.00
Store	1	20.00
Company specific <sup>b</sup>	1	20.00

*Note:*

<sup>a</sup>Local\_Text:All

<sup>b</sup>Company specific\_Text: Rancher's Daughter's Reserve

Table S17

*What are the specifications of the Local-level program(s)?  
(Select all that apply)*

Item	<i>f</i>	%
Weight	3	14.29
Quality grade	3	14.29
Antibiotic free	3	14.29
Locally raised	3	14.29
Breed	2	9.52
Size	2	9.52
Age verified	2	9.52
Natural	1	4.76
Source verified	1	4.76
Non-GMO	1	4.76

Table S18

*What are the specifications of the Store-level program(s)?  
(Select all that apply)*

Item	<i>f</i>	%
Breed	1	12.50
Size	1	12.50
Weight	1	12.50
Quality grade	1	12.50
Antibiotic free	1	12.50
Source verified	1	12.50
Age verified	1	12.50
Locally raised	1	12.50

Table S19

*What are the specifications of the Company Specific program(s)?  
(Select all that apply)*

Item	<i>f</i>	%
Breed	1	10.00
Size	1	10.00
Weight	1	10.00
Quality grade	1	10.00
Natural	1	10.00
Antibiotic free	1	10.00
Source verified	1	10.00
Age verified	1	10.00
Locally raised	1	10.00
Non-GMO	1	10.00

Table S20

*What does your company/organization believe the “strengths” of the pasture raised beef industry are? (Rank your top 3 and use the corresponding text box to explain your response(s), as needed)*

Item	M	SD	Rank1		Rank 2		Rank 3	
			f	%	f	%	f	%
Availability <sup>a</sup>	1.00	0.00	1	100.00				
Consistency <sup>b</sup> (3)	1.50	0.50	1	50.00	1	50.00	-	-
Consumer demand <sup>c</sup> (1)	2.25	0.83	1	25.00	1	25.00	2	50.00
Marketing programs <sup>d</sup>	3.00	0.00					1	100.00
Product quality <sup>e</sup> (2)	2.00	0.82	1	33.33	1	33.33	1	33.33
Taste <sup>f</sup>	2.00	0.00			1	100.00		

*Note.* Table organized in Item order, as presented on the survey. The numbers in parentheses reflect the rankings as determined by a combination of choice count, mean, and standard deviation.

<sup>a</sup>Availability\_Text: Grass is what we got the most of

<sup>b</sup>Consistency\_Text: The same all the time this is what customers want

<sup>c</sup>Consumer demand\_Text: Buyers are looking for pasture raised; With consistency you will have customer demand

<sup>d</sup>Marketing programs\_Text: Buyer likes the pasture model

<sup>e</sup>Product quality\_Text: Local

Table S21

*What does your company/organization believe the “weaknesses” of the pasture raised beef industry are? (Rank your top 3 and use the corresponding text box to explain your response(s), as needed)*

Item	M	SD	Rank1		Rank 2		Rank 3	
			f	%	f	%	f	%
Poor marketing <sup>a</sup>	1.00	0.00	1	100.00				
Product quality and specifications <sup>b</sup> (1)	1.00	0.00	2	100.00				
Supply <sup>c</sup> (2)	1.50	0.50	1	50.00	1	50.00		
Other <sup>d</sup> (3)	2.33	0.47			2	66.67	1	33.33

*Note.* Table organized in Item order, as presented on the survey. The numbers in parentheses reflect the rankings as determined by a combination of choice count, mean, and standard deviation.

<sup>a</sup>Poor marketing\_Text: Rancher don't have time to market. They are not sales people.

<sup>b</sup>Product quality and specifications\_Text: Some local branded producers have gone to the trouble of implementing programs to ensure quality consistency of their product because they understand how important that is for consumer experience.; Grading for consistency is everything.

<sup>c</sup>Supply\_Text: Subject to weather for quality/quantity of grass

<sup>d</sup>Other\_Text: Good grazing practices to produce good pasture beef in 30 months; Companies using other products and mixing in with grass fed and calling it local beef; Infrastructure needs to be updated to process more beef on island



Table S22

*What does your company/organization believe the “potential threats” of the pasture raised beef industry are? (Rank your top 3 and use the corresponding text box to explain your response(s), as needed)*

Item	<i>M</i>	<i>SD</i>	Rank1		Rank 2		Rank 3	
			<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Activist groups <sup>a</sup> (3)	2.00	0.82	1	33.33	1	33.33	1	33.33
Cost <sup>b</sup> (2)	1.67	0.47	1	33.33	2	66.67		
Federal regulation <sup>c</sup>	3.00	0.00					1	100.00
Public perception <sup>d</sup>	2.50	0.50			1	50.00	1	50.00
Other <sup>e</sup> (1)	1.00	0.00	2	100.00				

*Note.* Table organized in Item order, as presented on the survey. The numbers in parentheses reflect the rankings as determined by a combination of choice count, mean, and standard deviation.

<sup>a</sup>Activist groups\_Text: Urban sprawl; Animal rights

<sup>b</sup>Cost\_Text: Land costs; Available lands; Pricing going up in the mainland and ranchers start shipping and not leaving anything here

<sup>c</sup>Federal regulation\_Text: More and more

<sup>d</sup>Public perception\_Text: Bad products out there, give bad experience to consumer

<sup>e</sup>Other\_Text: Availability of good grazing land, pasture land is being lost to conservation, forestry, or development; Infrastructure needs to be updated to process more beef on island

Table S23

*How important do you think it is to establish a standardized method for local beef products?*

Item	<i>f</i>	%
Very important	3	60.00
Not important	1	20.00
Somewhat important	1	20.00

*Note:* 1 = Not important; 2 = Somewhat important; 3 = Very important. (*M* = 2.40; *SD* = 0.80)

Table S24

*Do you currently use a method to grade or sort your local beef products?*

Item	<i>f</i>	%
Yes	4	80.00
No	1	20.00

Table S25

*If so, what method do you use? (Select all that apply)*

Item	<i>f</i>	%
Visual appraisal	3	23.08
Age	3	23.08
Marbling	2	15.38
Color	2	15.38
Other <sup>a</sup>	2	15.38
Shear Test	1	7.69

*Note:* <sup>a</sup>Other\_Text: Animal temperament, visual finish of hanging carcass; Animal handling

*What is the most difficult sub-primal or retail cut for your company to market locally?*

- None/NA (2)
- Strip loins
- Clods
- Rounds

# **Producer Survey Data Report**

## Producer Survey-Descriptive Statistics

( $N = 44$ )

- Because of the small response number, I did not include graphs in this section. Graphs with small response numbers tend to make the data appear exaggerated.

Data notes that should be considered when interpreting these results:

- There was one survey that was collected at the Annual Convention that did not provide their name. The anonymous survey that was collected was an “X-Large (1001+ head)” operation. Throughout the surveying process there were problems with collecting duplicate surveys from individual ranches/producers. If this was a duplicate response, the data are skewed, making the results reflect more information from large producers.
- The data from Question 5 (*Where do you market the majority of your calves?*) are NOT reliable. The question was written as select-one multiple choice question. If the response was submitted online, there was not an issue as the software regulates what kind of data can be submitted for a specific question type (e.g., only one answer choice can be chosen on a select-one multiple choice question). However, because most of the responses were completed via the paper version, many did not follow the directions on this specific question. Seventeen (39%) of the respondents chose more than one response. Based on this, I changed the analysis of this question to be frequencies and percentages (no indications of means and standard deviations), but the reader should also be aware that the other 61% followed the directions and only chose one option when they may have been able to choose additional options, if given the opportunity.

Table P1

*What is the size of your operation?*

Item	$f$	%
Small (1-100 head)	15	34.1
Medium (101-500 head)	8	18.2
Large (501-1000 head)	7	15.9
X-Large (1000+ head)	14	31.8

*Note:* Table organized in Item order, as presented on the survey.  $M = 2.45$ ;  $SD = 1.27$

Table P2

*How long has your operation been in business?*

Item	$f$	%
<10 years	5	11.4
10-25 years	14	31.8
26-50 years	6	13.6
51+ years	19	43.2

*Note:* Table organized in Item order, as presented on the survey.  $M = 2.89$ ;  $SD = 1.10$

Table P3

*Where do you market the majority of your calves?*

Item	<i>f</i>	%
Conventional feed lot – Sell at weaning	24	35.3
Local grass-finished market	22	32.4
Conventional feed lot – Retain ownership	10	14.7
Breeding stock	7	10.3
4-H project animals	3	4.4
Other <sup>a</sup>	2	2.9

*Note:* Table organized descending percentage order. <sup>a</sup>Other\_Text: 500 a year to slaughter

Table P3.1

*What percentage goes to each?*

Item	<i>M</i>
Conventional feed lot – Sell at weaning	44.76
Local grass-finished market	22.65
Conventional feed lot – Retain ownership	13.29
Breeding stock	11.34
Other	7.56
4-H project animals	0.40

*Note:* Table organized descending mean order. Total percentage may not equal 100 due to rounding.

Table P4

*Are you interested in increasing the number of animals you market locally?*

Item	<i>f</i>	%
Yes	37	84.1
No	6	13.6

*Note:*  $M = 1.14$ ;  $SD = 0.35$

Table P5

*What percentage of your total herd would you ideally target for the local market?*

Item	<i>f</i>	%
>10%	5	11.4
11-25%	13	29.5
26-50%	6	13.6
51-75%	4	9.1
76-100%	16	36.4

*Note:* Table organized in Item order, as presented on the survey.  $M = 3.30$ ;  $SD = 1.50$

Table P6

*What barriers prevent you from marketing more cattle locally?*

Item	<i>f</i>	%
Limited acreage	21	20.19
Limited markets	21	20.19
Potential for drought	18	17.31
Access to processor	16	15.38
Limited access to locally available forages/hay/feedstuffs	9	8.65
Lower return on investment	8	7.69
Inconsistent quality	5	4.81
Other <sup>a</sup>	3	2.88
Nothing. I market all of my cattle locally.	2	1.92
Food safety	1	1.00

*Note:* Table organized descending percentage order. Total percentage may not equal 100 due to rounding.

<sup>a</sup>Other\_Text: Ability to market true local from memorandum of understanding; Limited finishing pasture; Opportunity cost-margin on shipping and feeding vs reducing cow herd and finishing locally

Table P7

*Which of the following would be incentive(s) for you to market more of your cattle locally? (Select all that apply)*

Item	<i>f</i>	%
Increased returns	30	29.41
Access to local markets	26	25.49
Interest in serving the local community	18	17.65
Interest in food security	11	10.78
Animal welfare	10	9.80
Other <sup>a</sup>	7	6.86

*Note:* Table organized descending percentage order. Total percentage may not equal 100 due to rounding.

<sup>a</sup>Other\_Text: Availability of county/state leased lands; Better price; Increase acreage (2); Increased processing opportunities; profit margin

Table P8

*Do you participate in any local-branded beef programs?*

Item	<i>f</i>	%
No	25	59.5
Yes	17	40.5

*Note:* Table organized descending percentage order.

*M* = 1.60; *SD* = .50

Table P8.1

*If Yes, what are the specifications of the program(s)?  
(Select all that apply)*

Item	<i>f</i>	%
Grass Fed/Grass Finished	17	25.00
Natural	11	16.18
Locally raised	10	14.71
Antibiotic free	8	11.76
Weight	7	10.29
Animal Welfare Certified	5	7.35
Size	4	5.88
Breed	3	4.41
Source verified	3	4.41

*Note:* Table organized descending percentage order. Total percentage may not equal 100 due to rounding.

Table P9

*Do you believe there is variability in the  
quality of local beef products?*

Item	<i>f</i>	%
Yes	41	93.2
No	1	2.3

*Note:*  $M = 1.02$ ;  $SD = 0.15$

Table P10

*How important do you think it is to establish a standardized method for  
local beef products?*

Item	<i>f</i>	%
Very important	35	83.3
Somewhat important	7	16.7
Not important	0	0.0

*Note:* Table organized descending percentage order. 1 = Not important; 2 = Somewhat important; 3 = Very important. ( $M = 2.83$ ;  $SD = 0.38$ )

Table P11

*Do you currently use a method to grade or sort your local  
beef products?*

Item	<i>f</i>	%
Yes	24	58.5
No	17	41.5

*Note:*  $M = 1.41$ ;  $SD = 0.50$



Table P11.1

*If Yes, what criteria do you use? (Select all that apply)*

Item	<i>f</i>	%
Age	24	28.24
Visual appraisal	19	22.35
Weight	19	22.35
Genetics/Genomic tests	12	14.12
Based on pasture conditions	8	9.41
Other <sup>a</sup>	2	2.35
No specific criteria-whatever comes in that day	1	1.18

*Note:* Table organized descending percentage order. Total percentage may not equal 100 due to rounding. <sup>a</sup>Other\_Text: Sex (2)

Table P12

*What do you think are the most important production factors to consider when raising local beef? (Select all that apply)*

Item	<i>f</i>	%
Genetics	38	16.10
Age	33	13.98
Type of pasture	29	12.29
Animal welfare	27	11.44
Animal nutrition	25	10.59
Supplements	21	8.90
Weight	20	8.47
Connection to consumer/community	17	7.20
Food safety	14	5.93
Food security	12	5.08

*Note:* Table organized descending percentage order. Total percentage may not equal 100 due to rounding

Table P13

*What is your feeding/supplement strategy for the beef cattle that you finish and market locally? (Select all that apply)*

Item	<i>f</i>	%
Loose minerals	26	28.89
Grass only; we don't supplement	25	27.78
Mineral blocks	16	17.78
Lick tubs	14	15.55
Hay, cubes, cake, or pellets	4	4.44
Green chop or silage	3	3.33
Brewer's or distiller's grains	1	1.11
Other <sup>a</sup>	1	1.11

*Note:* Table organized descending percentage order. Total percentage may not equal 100 due to rounding. <sup>a</sup>Other\_Text: Right now don't have a specific strategy

Table P14

*What are your future plans relative to the next five years in terms of production levels? (Select all that apply)*

Item	f	%
Increase herd numbers	25	58.14
Keep animal numbers stable; no change	18	41.86
Decrease herd numbers	-	-
Retire/Get out of business	-	-

*Note:* Table organized descending percentage order.

*Are there any additional thoughts you have on creating a standard for local, grass-finished beef?*

- We need a processing plant! We could not get a booking for the past 3 years. Even just to harvest, cut and wrap for home use. Finally found someone (local person) to do 2 steers for us and is also able to take a couple more whenever we want. Very grateful and satisfied with his service.
- It would be a lot easier if there were more procession slaughterhouses available. We are very limited here in the islands.
- Continue to engage processors and retail/food service partners
- Post-harvest grading systems would be very helpful (adopted at a state level)
- A method to reward producers based on quality grade, age, and cutability would be great, but difficult due to lack of federal graders availability. Genomic verified cattle for tenderness would improve logistics to produce "verified tender" beef.
- Some type of quality/grade of beef for market
- Standard?
- Educating smaller producers about the importance of genetics and having consistent quality in beef production
- Genetics
- Getting more return on investment
- Not all ranchers are able to raise grass finish beef for lack of strong pastures to finish within a needed age limit
- Seems this would be a challenge. You are what you eat. If you go 100% grass finish, one animal on kikuyu and one on Akoa by the ocean you're almost certain to have 2 different looking and probably tasting carcasses. Finding consistency is the "nut" that has to be cracked.
- We are cow calf producers with inconsistent forage to produce the finished product. Having a local grass finisher available to sell to would make feeding our calves into our local market more appealing than sending all calves to the mainland
- Strategic plan is to move towards seed stock producer and supply of local beef marketing for local production

## Producer Survey-Inferential Statistics

It is important to first note that there are types of data that are not appropriate to analyze with inferential statistics. Unfortunately, many of these data fall into that category (nonparametric data). When possible, I tried to provide alternate insight into what could be interesting information.

### Comparison Based on Operation Size

- There were differences found in two questions based on operation size: Q11 and Q15

Table P15

*Means, Standard Deviations, and One-Way Analyses of Variance for the Effects of Operation Size on Survey Responses*

Item	Small (1)		Medium (2)		Large (3)		X-Large (4)		F	p
	M	SD	M	SD	M	SD	M	SD		
Q11	1.86	.36	1.63	.52	1.57	.54	1.31	.48	3.21	.034
Q15	1.71	.47	1.29	.49	1.29	.49	1.23	.44	2.97	.044

*Note.* Only questions with significant statistical differences ( $p < .05$ ) are shown.

Q11 & Q15 Scale: 1 = Yes; 2 = No

Upon further investigation into the significant differences, the following statements can be made for the respective questions based on operation size categories:

- Q11- Do you participate in any local-branded beef programs?
  - 1 is different than 4
  - Small operations (1-100 head) are less likely to be currently participating in local-branded beef programs than X-Large operations (1001+ head).
- Q15- Do you currently use a method to sort/identify animals selected for the local beef market?
  - 1 is different than 4
  - Small operations (1-100 head) are less likely to be using a method to sort/identify animals selected for the local beef market than X-Large operations (1001+ head).

### Comparison Based on Operation Duration

- There were differences found in one question based on operation duration: Q3.

Table P16

*Means, Standard Deviations, and One-Way Analyses of Variance for the Effects of Operation Duration on Survey Responses*

Item	<10 yrs (1)		10-25 yrs (2)		26-50 yrs (3)		51+ yrs (4)		F	p
	M	SD	M	SD	M	SD	M	SD		
Q3	1.60	1.34	1.71	.83	3.00	1.27	3.05	1.78	5.42	.003

*Note.* Only questions with significant statistical differences ( $p < .05$ ) are shown.

Q3 Scale: 1 = Small (1-100 head); 2 = Medium (101-500 head); 3 = Large (501-1000 head); 4 = X-Large (1001+ head)

Upon further investigation into the significant differences, the following statements can be made for the respective questions based on operation duration categories:

- Q3- What is the size of your operation?
  - 1 and 2 are different than 3 and 4
  - Operations that have been in business for a longer amount of time run larger operations.

### Comparison Based on Local-Branded Beef Program Participation

- There were differences found in two question based on local-branded beef program participation: Q14 and Q15.
- Note: This comparison of the means was run using a t-test (only 2 means to compare—Yes and No groups), so the language is a bit different.

Table P17

#### *Group Differences Between Local-Branded Beef Program Participants on Survey Responses*

Item	Yes (1)		No (2)		<i>F</i>	<i>p</i>	<i>Cohen's d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Q14	2.71	.47	2.92	.28	14.28	.001	.54
Q15	1.00	.00	1.71	.46	76.97	.000	-

*Note.* Only questions with significant statistical differences ( $p < .05$ ) are shown.

Q14 Scale: 1 = Not important; 2 = Somewhat important; 3 = Very important

Q15 Scale: 1 = Yes; 2 = No

Upon further investigation into the significant differences, the following statements can be made for the respective questions based on participation in local-branded beef programs:

- Q14-How important do you think it is to establish a standardized method for local beef products?
  - Producers who do not participate in local-branded beef programs believe establishing a standardized method for local beef products is very important.
  - Statistically this has a medium effect size (the difference between the means is moderately important)
- Q15-Do you currently use a method to sort/identify animals selected for the local beef market?
  - Producers who participate in local-branded beef programs have a method to sort/identify animals for the local beef market.
  - Producers who do not participate in local-branded beef programs are less likely to have a method to sort/identify animals for the local beef market.
  - No effect size was calculated for this item as the SD was 0.00 for the Yes group.

# **Consumer Survey Data Report**

## Consumer Survey-Descriptive Statistics

( $N = 610$ )

Two qualifying questions were asked in the consumer survey:

- Are you a resident or a visitor in Hawaii?
- Do you eat beef?

If the respondent answered “No” to either of these, they were automatically disqualified and sent to the end of the survey.

Table C1

*How long have you lived in Hawaii?*

Item	<i>f</i>	%
< 1 year	22	3.61
1 – 5 years	79	12.95
6 – 10 years	44	7.21
11 – 25 years	141	23.11
26+ years	324	53.11

Note.  $M = 4.09$ ;  $SD = 1.20$

Table C2

*What is your age?*

Item	<i>f</i>	%
< 23 years old	78	12.79
24 – 39 years old	199	32.62
40 – 55 years old	192	31.48
56 – 74 years old	135	22.13
75+ years old	6	0.98

Note.  $M = 2.66$ ;  $SD = 0.99$

Table C3

*What is your gender?*

Item	<i>f</i>	%
Female	378	61.97
Male	232	38.03

Note.  $M = 1.62$ ;  $SD = 0.49$

Table C4

*Approximately how often do you eat beef?*

Item	<i>f</i>	%
< 5 times per year	26	4.26
5 – 10 times per year	28	4.59
1 – 2 times per month	80	13.11
1 – 2 times per week	245	40.16
3 – 5 times per week	193	31.64
> 5 times per week	38	6.23

Note.  $M = 4.09$ ;  $SD = 1.12$

Table C5

*What meat cuts do you buy most often? (Select all that apply)*

Item	<i>f</i>	%
Ground beef	532	22.74
Steak	511	21.85
Roast	278	11.89
Thinly sliced beef (e.g., teriyaki, butayaki)	277	11.84
Stew meat	267	11.42
Beef for stir-fry, chopped steak	247	10.56
Brisket	136	5.81
Variety meats (e.g., heart, liver, kidney, tongue, tripe, oxtail)	75	3.21
Other <sup>a</sup>	16	.68

<sup>a</sup>*Other Text:*

- Ribs (4)
- Tenderloin
- Prepared beef/ I only buy prepared beef from restaurants (2)
- Deli meats

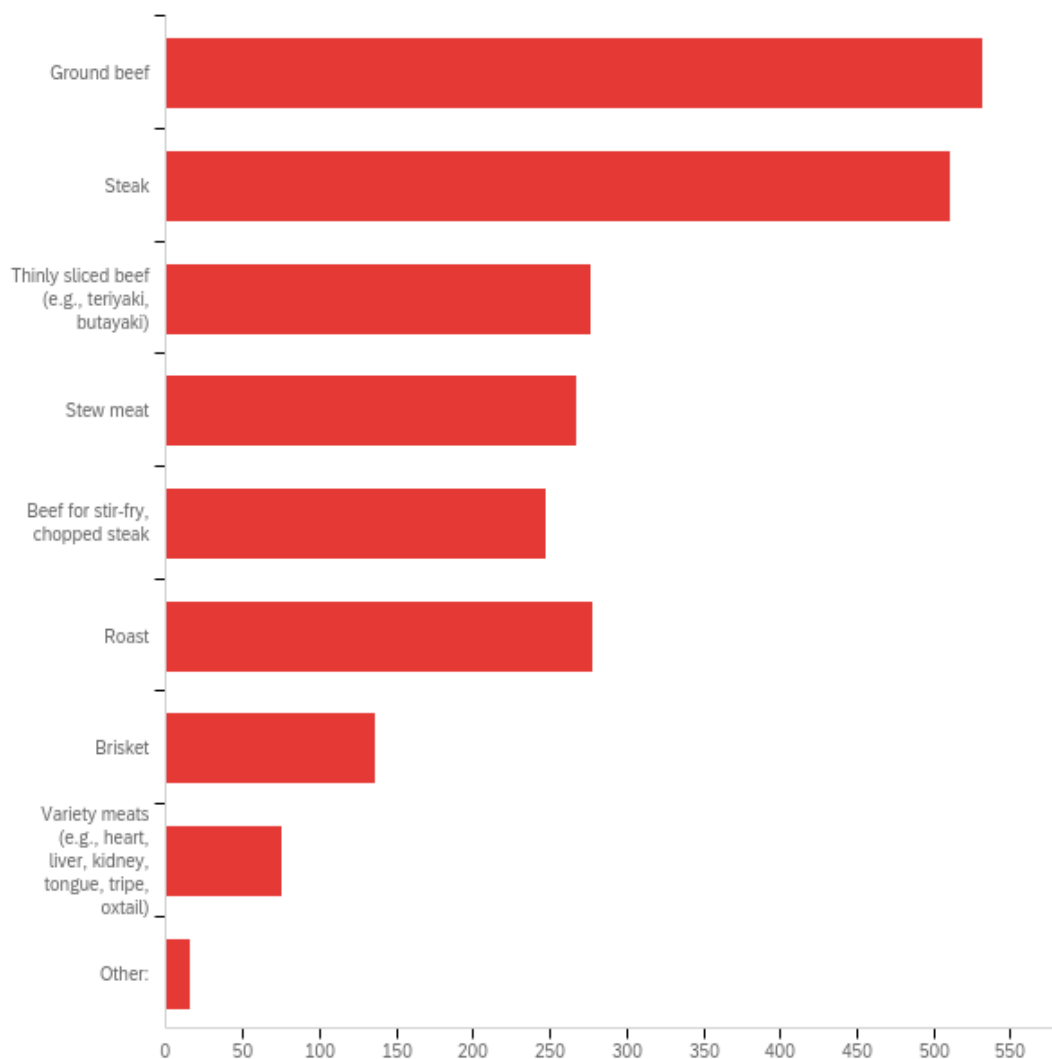


Table C6

*What drives your beef purchases? (Rank your top 3 in order of importance with 1 being most important)*

Item	Rank1		Rank 2		Rank 3	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Price (1)	263	51.77	137	26.97	108	21.26
Cut (3)	96	29.27	131	39.94	101	30.79
Local sourcing	32	19.51	52	31.71	80	48.78
Convenience of preparation	22	28.21	26	33.33	30	38.46
Quality (2)	155	35.07	162	36.65	125	28.28
Consistency	2	5.56	12	33.33	22	61.11
Visual appearance – color/texture	40	15.63	81	31.64	135	52.73

*Note.* Table organized in Item order, as presented on the survey. The numbers in parentheses reflect the rankings as determined by choice count (seen in the graph below).

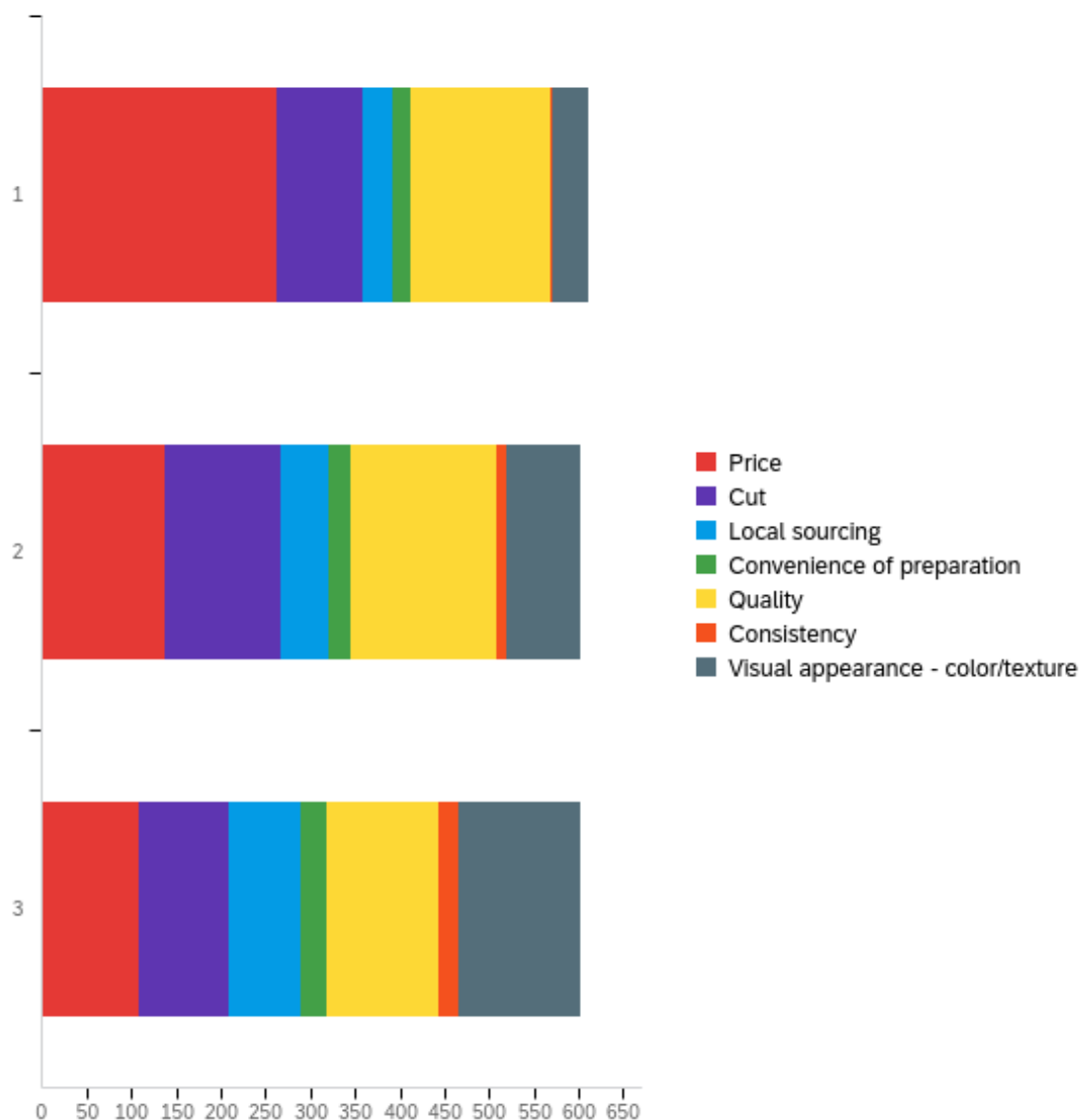




Table C7

*Do you primarily purchase local, pasture-raised beef?*

Item	<i>f</i>	%
Yes	345	56.56
No	265	43.44

*Note.*  $M = 1.43$ ;  $SD = 0.50$

Table C8

*Given all other factors being equal, please rank your preferences when purchasing beef. (1 = First choice; 4 = Last choice)*

Item	Rank 1		Rank 2		Rank 3		Rank 4	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Local, grass-finished beef (1)	444	79.14	76	13.55	30	5.35	11	1.96
Local, grain-finished beef (2)	77	13.92	329	59.49	121	21.88	26	4.70
Imported, grass-finished beef (3)	31	5.67	121	22.12	318	58.14	77	14.08
Imported, grain-finished beef (4)	12	2.21	27	4.89	82	15.13	421	77.68

*Note.* Table organized in Item order, as presented on the survey. The numbers in parentheses reflect the rankings as determined by choice count (seen in the graph below).

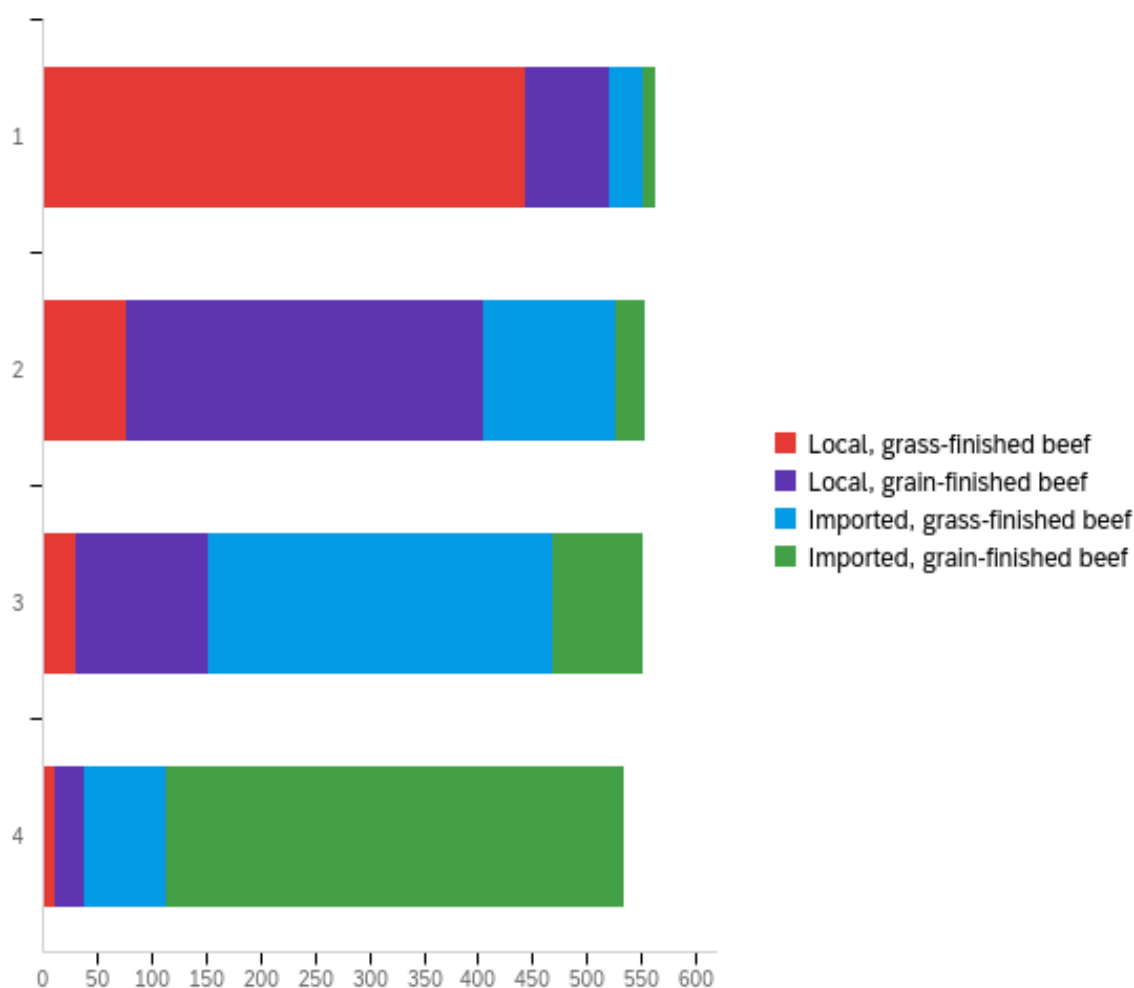


Table C9

*What does the term “eating satisfaction” mean to you when eating beef? (Select all that apply)*

Item	<i>f</i>	%
Flavor	467	26.70
Tenderness	431	24.64
Juiciness	375	21.44
Overall palatability	283	16.18
Marbling	193	11.03

Table C10

*Does local, pasture-raised beef consistently satisfy your expectations for a desirable eating experience?*

Item	<i>f</i>	%
Yes	565	92.62
No	45	7.38

*Note.  $M = 1.07$ ;  $SD = 0.26$*

Table C11

*A quality grade helps consumers understand the eating satisfaction of a product (e.g., prime, choice, etc.). If local, pasture-raised beef products were assigned a quality grade, would that help drive your decision making? (Please use the corresponding text box to explain your response)*

Item	<i>f</i>	%
Yes	489	80.16
No	121	19.84

*Note.  $M = 1.20$ ;  $SD = 0.40$*

*If “Yes”, why?*

Help make a more informed/better decision (125)

- As consumers we already are familiar with the meat grades so it would be helpful if the local market also used the same grade system
- I could see the opinion of others
- It would just be more information to help you make a better decision.
- I believe I would make a more informed decision.
- I would know what to expect
- More info the better
- It would be interesting and educating
- It may help it make it easier for me to make a decision
- Because I would have a better understanding of the quality of my purchase
- It would be much easier to know which is hood other than looking at it
- It would be easier to choose what I bought if I knew what the quality of the beef is.
- it would cut the confusion between different qualities
- I won't have to examine the meat because it will be label for what I'm looking for.

- The more information I have to make consumer decisions the better!
- I would easily know what I'm buying
- it would make it easy
- I think when people see a grade It may be helpful to those who may not know how to buy meats or beef
- I would know the exact grade instead of guessing
- I would know which meat is better quality
- Yes because I would want to know the quality I'm paying for
- It would let me know what I'm buying
- I want to know the grade of beef before I purchase.
- It gives me a better idea of the quality grade of the beef product that helps me decide what to purchase.
- It would be very informative if there was an explanation as for as differentiating between the different types of beef there was so that I would have a
- faster time deciding what type of beef to buy.
- easy for me to tell
- all beef has a grade, local beef being graded on the same standard would make the quality much clearer
- It would make me confident in my buying decision
- Would provide info
- Easier to understand
- Pasture raised products are for me, more about how the animal was cared for. I would consider them having a quality grade based on the desired cut/fat
- content of meat. Overall I think it would be easier for me to purchase a pasture-raised prime cut rib-eye, and be satisfied with my personal feelings how
- the animal was raised/feed and a nice cut of meat for dinner.
- It's nice to know these things when purchasing.
- Would know the deferent Quality of the meat.
- If there is a uniform quality grade we can compare brands
- Help when comparing
- For certain cuts of beef the quality known highly influences my choice
- it takes the guess work out
- I would get a better understanding of the quality.
- Yes as I would know what type of quality I am buying and will feed my family.
- Knowing the grade of beef would definitely help by knowing the quality of the beef I'm buying.
- That will help me decide if the beef is good
- make easier to distinguish different types and comparisons
- it will help determine if the price is worth it
- It would make it easier to narrow the choices I need to look through
- Gives me more information
- The more information about the product is better because then I can know what I am putting in my body
- assist in decision making
- Possibly I might put more thought into my choice
- Good information to make a good choice
- Because it would help me know if it is better or nit
- Then i would have the information to make a good purchase
- It would give me a better understanding o what I am purchasing and how desirable it is
- I feel like the quality grade makes it easier for those who don't know much about beef, but will still help them find quality beef.
- Would qualify the choice
- I know where the meat is coming from
- Yes because it that shows it's credibility.
- it would help me choose the best cut that i'm looking for
- I wasn't aware of that in the first place - so now I can't compare & contrast correctly.

- I would like to know what I'm eating
- It would let me know if they are good or not
- because it gives the consumer insight into the type of purchase they are making
- It would help with picking the better option
- Then we can know it better to make a better decision.
- It gives an idea of the quality of beef to compare with the mainland products.
- it's easier to make a choice
- Then I'd know how much better the meat is better quality
- Helps me decide where to spend my money, if the item is worth it
- Easier to compare
- At least I would know it was inspected.
- Knowledge of how the meat compares
- Yes because not just anyone can tell if the meat is good, all they could do is read it look at it and see the pounds, where I can tell a lot more. So doing
- this will make it much easier for them
- More information is always good.
- Clear up confusion
- helps make my decision
- Anything that can help me select the best cut of meat is helpful. Another thing I can tell my son to look for when shopping for me.
- would give me a comparison to mainland same product
- I want to know the grade
- grades with descriptors posted in the meat section
- It would me with a measure or comparison that would help in making a decision to purchase.
- makes it easier for me to compare with import meat
- It would make it easier to decide what to buy.
- so we know!
- having a rating scale might improve the decision i make.
- grading makes things easier to understand
- I would be more wiling to buy it.
- If there was a quality grade much like fat percentage I would always choose a higher number
- I would find this helpful in selecting cuts of beef
- If I'm buying beef, especially steak, I would want the best choice available
- I would seek those out first
- I could compare quality and price for local and non-local beef
- Justify quality and price
- Better quality would increase the chances I'd purchase the beef
- Quality ratings are necessary to chose the cut
- I could better balance price/value vs quality
- Yes because it will give me another's opinion instead of my own
- It helps save money if I know what the quality of the meat I'm buying
- Gives me an idea of how good it is.
- Others say it's good, I would also say it's good
- For better comparison for cuts
- I'd be more willing to purchase the beef
- It would give me a better assessment of just how good the beef products are.
- I would seek out better graded meats.
- It would help since I am not very familiar with this kind of beef.
- I would prefer it and buy it
- Like food and cars, a grade provides the consumer a way to set expectations on the quality of the beef they will be eating.

- I would like it as it shows the quality of the beef. I would be willing spend more on better quality beef.
- So we know what level it's at for future reference
- Because I would trust it
- I'm not very picky and I usually pick based on what the packaging says about the product.
- I would be more interested in buying it.
- rating would justify the price paying for the beef product
- because you would know what you're getting for your money
- Would make it easier to distinguish the grade
- Appearance, Cost Taste, & Texture
- Prime would be appealing
- Quality and price
- if good quality and good price would be great
- A higher grade would be better
- As a gauge
- I could tell what beef is local
- I do look at grades when I make purchase of meats
- The price would be different on the different grades

#### Indication of quality, flavor/Quality assurance (75)

- Makes it easier to judge quality
- Prefer prime beef
- quality over quantity
- Good quality
- Having a grade would establish a baseline of quality and flavor.
- Quality assurance
- It would identify the quality of the product.
- Because I love better quality meat
- Knowing it's fine quality sure
- it would somewhat guarantee the quality
- Even though local, the quality is very important.
- has to be good quality
- We try to purchase the higher quality, labeling product grade helps us the consumer know what we are buying
- It would help me to know how good the quality is
- I know the quality right away
- I would buy the highest grade
- It indicates to me the quality of the beef
- Absolutely insanely prime
- I prefer pasture-raised beef products with a quality grade. If possible, I rather purchase a beef product from here (Hawaii).
- i want quality
- I prefer prime grades
- to assess tenderness/quality
- I follow the quality grade
- Yes it would because it ensure the quality of beef
- yes because i love quality
- Yes, if the quality is I would try to buy local.
- It's important to know the quality
- it would help to know the quality
- I would generally like to eat better quality meats
- It would let me get an idea of the quality
- I could depend on a professional to rate the quality of the meat:

- assures me of quality
- quality grade means best of cut to me
- higher grade usually means higher quality and taste
- Yes because it would help us denote quality
- Yes, I would. Great quality grade meat is always beat
- Then I would know the quality of the meat
- it would help to determine which is the better quality
- A grade given to the beef would allow me to establish a baseline for the quality of the beef.
- Easy to know what's best
- it reassures me that what I am eating is the highest quality
- It would describe the positive attributes of the beef
- Yes, just as the type of cut helps to drove your purchase, a grade could also be a rating system in accordance to the cut quality
- The tenderness of the meat
- better quality better tasting, grass grazed beef is always of higher quality and worth paying more for
- Always looking for the best in beef.
- It just adds another layer of official approval of quality
- If it's a high quality grade I'd buy it
- It's a way to grade the beef. According to the standards
- The assurance
- It would give me more of an assurance of quality
- If it was of good quality
- it's probably better
- Local beef is the best. It would be good to know what the quality is.
- because it will ensure better consistency
- Because there is a big difference in the quality of meat and people that know meat will be more attracted to buying more local higher quality products
- It would help me because when I invite guests to my home for meals, I want higher quality beef to serve my guests
- Yes, because it is quality
- Yes, because the greater the beef the better!
- It would Because I know it's held to a certain standard
- It would indicate to me how good the product was.
- High quality makes me feel like it's safer to eat
- assured a good cut
- taste great and lean
- Better flavor
- More flavor and better cuts
- helpful to know what to expect
- Of course. It is like putting a grade to the food I eat
- Because higher grade is best for safety of health.
- It would to know how fatty the meat is
- May be taste better?
- Prefer lower fat
- I like extra lean, less fat
- I know that I would always be satisfied.
- Taste and moistness

#### Support local (26)

- Yes, because I believe in supporting local businesses
- Only says local grass fed

- Support local farmers
- Supporting local business
- Local grown; locally resourced beef
- Local helps community
- I would choose local over import
- It would make me more inclined to buy local.
- I typically buy 'prime grade' so I would probably lean towards buying local pasture beef more if it had a label.
- if the price is not too high I will buy local beef
- Id be more inclined to believe a local company with labeling their meat quality. It would also be nice to know more about the meat I am selecting.
- Local sourcing is better choice
- Local pride in raising cattle
- local product
- I believe in shopping local and the grading would DEFINITELY help me in purchasing the beef
- We are still learning what to buy but I support our local farmers
- Locally owned and raised
- Support local
- It's more help to local farmers if it's locally sourced food
- local beef that is label always taste better
- I always choose local
- I like to locally source when can
- I suppose if I had an additional guarantee it'll further cement my decision but Ill still buy local.
- The overall look of the cut and a clear indication that's its locally sourced is what I look for.
- Simply because it is local and assigned a quality grade
- Yes I try to always buy grass fed local

Yes, but... (14)

- I assume they have to comply with some standards in order to achieve this grade
- IT MUST HAVE THE USDA STAMP
- It's subjective, but I prefer prime grade
- I would assume the grading is accurate.
- It is based on others opinions
- I think it would be nice to see it but I would already believe it would be of a higher quality.
- To a point. It depends on the rating criteria
- Yes, once consistency was established
- Cost is a factor
- but the main deciding factor will be price
- Mostly the price
- taste is one thing, but price also drives the decision
- As long as the grading scheme is fair
- maybe depending on how well understood the grading was

MISC responses (11)

- Hawaii pastor have natural iron & nutrients located in
- Not sure if they sell local raised beef at Costco where I do all my meat shopping
- Yes I would feel more of a guarantee of freshness.
- The freshness and quality
- fresh than mainland's beef
- Helps keep customers inform on how meat was treat prior to purchasing it.
- I like my meat to be very organic with no chemicals.
- It would Express a place in worldwide categorization

- it is safer
- Because it's fresh
- Less added hormones.

*If "No", why?*

Purchase based on other factors (38)

- Grass-fed / local (12)
  - I like my grass fed beef
  - I choose grass fed over anything else.
  - prefer grass fed
  - I would still choose to buy local grass fed no matter the grade
  - local is always better than imported
  - Would still buy whatever the scale
  - I would buy anyway
  - I already prefer local beef products
  - I like supporting local
  - Buying local and supporting local
  - local pasture raised is good enough for me.
  - Its already local
- Price / Appearance / Cut / Use (14)
  - price first.
  - Depends on price
  - It still comes down to price
  - I buy based on price
  - If it's too expensive I will get the more affordable one.
  - It's more the price
  - Only if the price was lower than other choices.
  - I always go by what the meat actually looks like when I choose it, so grades don't really mean anything to me.
  - I usually go by price and cut
  - Price and appearance would be more motivating
  - I just look for visual/price
  - I don't look for grades just the price and cut and visual
  - I would base my purchase on price, look, and what I intend to use the meat for.
  - I go more by appearance
- Other (10)
  - I usually buy what is available
  - Needs to be organic
  - Just knowing it is local and pasture raised is good with me
  - I don't buy meat according to quality grade, but I believe if the local beef was assigned a quality grade, I am sure a lot of people would probably purchase the local beef.
  - I use less desirable cuts to stretch my food budget
  - I do not rely on grading to choose what I want.
  - It's all relative. Would prefer to purchase local, to support local economy but price and quality is what drives me
  - Because the higher quality the better
  - Grade not important as overall quality

Uninterested (11) / Not needed (7)

- not interested
- Don't care



- To me there is no difference
- It wouldn't help my decision
- No my decision is already made
- it would be the same
- I like beef so I don't care
- Wouldn't matter
- I'm happy as it is
- I am not too particular when it comes to grades of meats
- I don't spend time at the store looking at beef.
- No, but I might try it but I prefer the meat that I eat already
- I already expect it to be higher quality
- I know the islands well so local means local
- I feel like local beef is already of good quality
- If I were eating out, it might drive my decision making, but for home consumption, it wouldn't matter
- All local pasture raised beef has been excellent quality
- The fact that it's local and pasture raised is quality already
- Grass finished beef is always tender

#### Grading systems are flawed (6)

- Quality is subjective, doesn't mean anything. Just a marketing method to charge more.
- I don't think ranking is consistent
- judge the meat ourselves, not depending on others for the grade
- It's someone's opinion
- Just a marketing gimmick
- Do not always trust the grading process

#### Unsure of/do not understand grading systems (6)

- I would need to know exactly what it is based on.
- I don't know the grades
- I don't know if it would add value to my decision
- I don't have a full understanding of the grade system
- I do not know the grades
- I would have to know how the scale works first

Table C12

*Please tell us how important the following attributes of local, pasture-raised beef are to you.*

Item	<i>n</i>	<i>M</i>	<i>SD</i>
Food safety – knowing beef is wholesome, free of disease-causing agents	610	4.66	.77
Overall eating satisfaction	610	4.44	.81
Appearance of meat – color and texture	610	4.40	.86
Natural label – never been treated with antibiotics or added hormones	610	4.07	1.07
Grass-fed label – fed 90% or more on pasture	610	3.95	1.06
Locally sourced – Hawaii born and raised	610	3.95	1.06
How and where the cattle are raised	610	3.86	1.10
Branded product (recognized label indicating a Hawaii-specific producer)	610	3.61	1.13

*Note:* 1 = Not important; 2 = Low importance; 3 = Neutral; 4 = Moderately important; 5 = Very important

Table C13

*What is your perception of local ranchers in regards to:*

Item	<i>n</i>	<i>M</i>	<i>SD</i>
Food production	609	4.04	.87
Environmental stewardship	609	3.93	.94
Animal welfare	608	3.98	.96

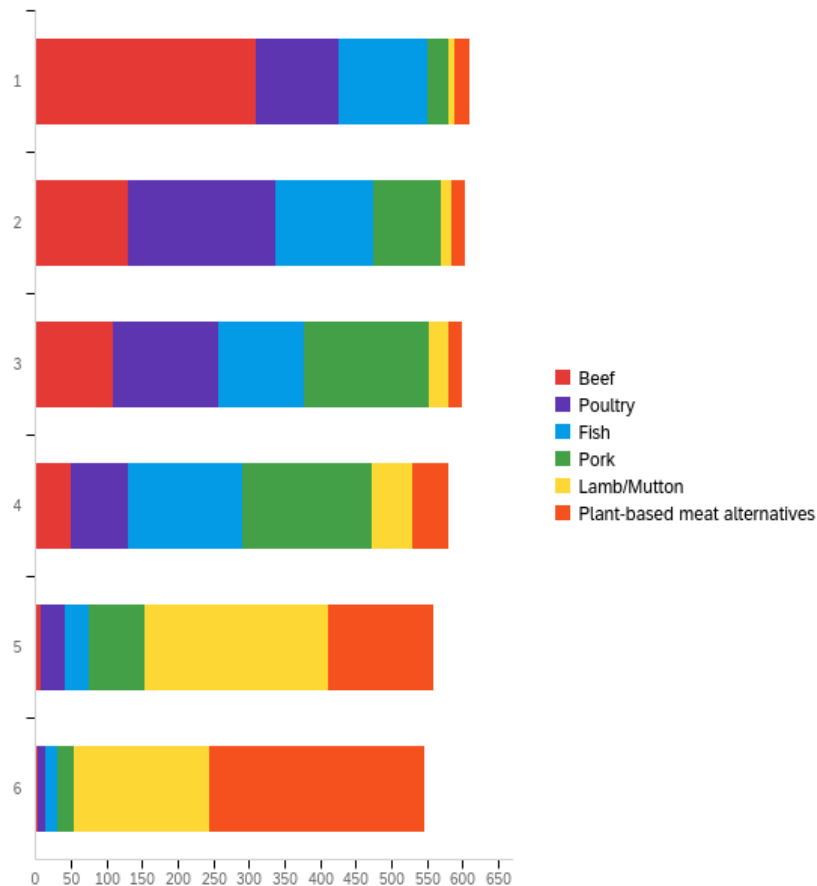
*Note:* 1 = Very negative; 2 = Negative; 3 = Neutral; 4 = Positive; 5 = Very positive

Table C14

*Please rank your preference of protein(s) in the marketplace. (You may rank from 1- 6 items. Please rank from 1 being most preferred.)*

Item	Rank 1		Rank 2		Rank 3		Rank 4		Rank 5		Rank 6	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Beef (1)	309	50.82	129	21.22	108	17.76	50	8.22	8	1.32	4	0.66
Poultry (2)	117	19.70	207	34.85	148	24.92	79	13.30	33	5.56	10	1.68
Fish (3)	124	20.88	138	23.23	121	20.37	161	27.10	34	5.72	16	2.69
Pork (4)	29	4.96	96	16.41	175	29.91	182	31.11	79	13.50	24	4.10
Lamb/Mutton (5)	10	1.79	15	2.68	29	5.19	58	10.38	256	45.80	191	34.17
Plant-based meat alt. (6)	21	3.77	18	3.23	18	3.23	51	9.16	148	26.57	301	54.04

*Note.* Table organized in Item order, as presented on the survey. The numbers in parentheses reflect the rankings as determined by choice count (seen in the graph below). Pork was most often ranked 3<sup>rd</sup> but Fish received higher instances (clicks) as ranks 1 and 2 than Pork, giving it a lower mean.



## Consumer Survey-Inferential Statistics

It is important to first note that there are types of data that are not appropriate to analyze with inferential statistics. Unfortunately, many of these data fall into that category (nonparametric data). When possible, I tried to provide alternate insight into what could be interesting information.

### Comparison Based on Gender

- There were no real differences between how males and females responded to the questions.

### Comparison Based on Age

- There were differences found in four questions based on respondent age: Q15, Q16\_1, Q16\_6, and Q17\_2.

Table C15

*Means, Standard Deviations, and One-Way Analyses of Variance for the Effects of Age on Survey Responses*

Item	<23 yoa		24-39 yoa		40-55 yoa		56-74 yoa		75+ yoa		F	p
	(1)		(2)		(3)		(4)		(5)			
	M	SD	M	SD	M	SD	M	SD	M	SD		
Q15	1.12	.32	1.17	.37	1.27	.44	1.19	.39	1.50	.55	3.49	.008
Q16_1	3.78	1.14	3.92	1.10	3.98	1.01	3.68	1.17	2.67	1.37	3.57	.007
Q16_6	3.71	1.05	3.97	1.03	4.09	.98	3.90	1.13	3.33	1.86	2.55	.038
17_2	3.55	1.08	4.07	.89	4.01	.86	3.82	.99	3.83	.98	5.27	.000

*Note.* Only questions with significant statistical differences ( $p < .05$ ) are shown.

Q15 Scale: 1 = Yes; 2 = No

Q16 Scale: 1 = Not important; 2 = Low importance; 3 = Neutral; 4 = Moderately important; 5 = Very important

Q17 Scale: 1 = Very negative; 2 = Negative; 3 = Neutral; 4 = Positive; 5 = Very positive

Upon further investigation into the significant differences, the following statements can be made for the respective questions based on age categories:

- Q15- If local, pasture-raised beef products were assigned a quality grade, would that help drive your decision making?
  - 1 is different than 3; 1 and 2 are different than 5
  - <25 year olds (Gen Z) are different than 40-55 year olds (Gen X).
  - <25 year olds (Gen Z) and 24-39 year olds (Millennials) are different than 75+ year olds (Silent).
  - In general, the older the respondent, the less likely a grading system for local, pasture-raised beef products would drive their decision making.
- Q16\_1- Please tell us how important the following attributes of local, pasture-raised beef are to you. How and where the cattle are raised
  - 5 is different than 2 and 3
  - 75+ year olds (Silent) are different from 24-39 year olds (Millennials) and 40-55 year olds (Gen X).
  - The Silent Generation puts lower importance on how and where the cattle are raised than Millennials and Gen X.
- Q16\_6- Please tell us how important the following attributes of local, pasture-raised beef are to you. Locally sourced - Hawaii born and raised
  - 1 and 5 are different than 3
  - <25 year olds (Gen Z) and 75+ year olds (Silent) are different from 40-55 year olds (Gen X).
  - Gen X puts higher importance on locally sourced – Hawaii born and raised beef than Gen Z and the Silent Gen.
- Q17\_2- What is your perception of local ranchers in regards to: Environmental stewardship
  - 1 is different 2 and 3
  - <25 year olds (Gen Z) are different from 24-39 year olds (Millennials) and 40-55 year olds (Gen X).
  - Gen Z has a more negative perspective of local ranchers in regards to environmental stewardship than Millennials and Gen X.

### Comparison Based on Years of Residency in Hawaii

- There were differences found in three questions based on respondent years of residency in Hawaii: Q16\_7, Q16\_8, and Q17\_3.

Table C16

*Means, Standard Deviations, and One-Way Analyses of Variance for the Effects of Years of Residency in Hawaii on Survey Responses*

Item	<1 yr (1)		1-5 yrs (2)		6-10 yrs (3)		11-25 yrs (4)		26+ yrs (5)		<i>F</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Q16_7	4.18	.85	4.18	1.04	4.36	.81	4.30	.85	4.51	.82	3.45	.008
Q16_8	3.32	1.32	3.27	1.30	3.70	1.11	3.48	1.13	3.76	1.05	4.28	.002
Q17_3	3.59	1.05	3.85	1.06	3.82	.97	3.94	1.02	4.07	.89	2.41	.049

*Note.* Only questions with significant statistical differences ( $p < .05$ ) are shown.

Q16 Scale: 1 = Not important; 2 = Low importance; 3 = Neutral; 4 = Moderately important; 5 = Very important

Q17 Scale: 1 = Very negative; 2 = Negative; 3 = Neutral; 4 = Positive; 5 = Very positive

Upon further investigation into the significant differences, the following statements can be made for the respective questions based on age categories:

- Q16\_7- Please tell us how important the following attributes of local, pasture-raised beef are to you. Appearance of meat - color and texture
  - 2 is different than 5
  - Respondents who lived in Hawaii 1-5yrs place a lower importance on the appearance of meat-color and texture than those who live in Hawaii for 26+ years.
- Q16\_8- Please tell us how important the following attributes of local, pasture-raised beef are to you. Branded product (recognized label indicating a Hawaii-specific producer)
  - 1 and 2 are different than five
  - Respondents who lived in Hawaii for <1 yr and 1-5yrs are different than those who lived in Hawaii for 26+ years. Those who have lived on the island for these shorter amounts of time place less importance on branded product (recognized label indicating a Hawaii-specific producer) than those who have lived in Hawaii for 26+ years.
- Q17\_3- What is your perception of local ranchers in regards to: Animal welfare
  - 1 is different than 5
  - Respondents who lived in Hawaii for <1yr are different than those who lived in Hawaii for 26+yrs. Those who are new to Hawaii have a more negative perspective of local ranchers in regards to animal welfare than those who have lived in Hawaii for 26+ years.

### Comparison Based on Frequency of Beef Consumption

- There were differences found in seven questions based on respondent frequency of beef consumption: Q16\_1, 16\_2, 16\_3, Q16\_7, Q17\_1, Q17\_2, and Q17\_3.

Table C17

*Means, Standard Deviations, and One-Way Analyses of Variance for the Effects of Frequency of Beef Consumption on Survey Responses*

Item	<5x/yr (1)		5-10x/yr (2)		1-2x/mo (3)		1-2x/wk (4)		3-5x/wk (5)		>5x/wk (6)		<i>F</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Q 16_1	3.23	1.58	4.14	1.08	3.99	.96	3.80	1.07	3.88	1.11	4.05	1.09	2.68	.021
Q 16_2	3.96	1.48	4.68	.61	4.70	.74	4.63	.78	4.75	.60	4.76	.66	5.25	.000
Q 16_3	3.85	1.43	4.50	.75	4.38	.82	4.38	.81	4.63	.63	4.42	.79	5.47	.000
Q 16_7	4.04	1.40	4.50	.96	4.29	.92	4.33	.89	4.52	.70	4.61	.68	2.86	.015
Q 17_1	3.54	1.24	3.89	.96	3.98	.89	4.05	.85	4.13	.81	4.13	.81	2.51	.029
Q 17_2	3.35	1.33	3.64	1.10	3.90	.99	3.93	.89	4.05	.89	3.97	.85	3.26	.007
Q 17_3	3.31	1.44	3.75	1.04	4.01	.99	3.98	.94	4.09	.88	3.89	.80	3.55	.004

*Note.* Only questions with significant statistical differences ( $p < .05$ ) are shown.

Q16 Scale: 1 = Not important; 2 = Low importance; 3 = Neutral; 4 = Moderately important; 5 = Very important

Q17 Scale: 1 = Very negative; 2 = Negative; 3 = Neutral; 4 = Positive; 5 = Very positive

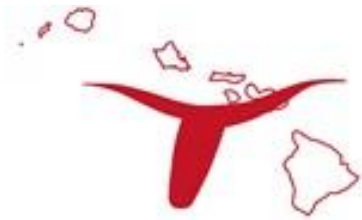
Upon further investigation into the significant differences, the following statements can be made for the respective questions based on age categories:

- Q16\_1- Please tell us how important the following attributes of local, pasture-raised beef are to you. How and where the cattle are raised
  - 1 is different than 2-6
  - Respondents who eat beef <5x/yr are different than all of the other respondents. They place a lower importance on how and where the cattle are raised.
- Q16\_2- Please tell us how important the following attributes of local, pasture-raised beef are to you. Food safety-knowing beef is wholesome, free of disease-causing agents
  - 1 is different than 2-6
  - Respondents who eat beef <5x/yr are different than all of the other respondents. They place an overall lower importance on food safety-knowing beef is wholesome, free of disease-causing agents.
- Q16\_3- Please tell us how important the following attributes of local, pasture-raised beef are to you. Overall eating satisfaction
  - 1 is different than 2-6; 3 and 4 are different than 5
  - Respondents who eat beef <5x/yr are different than all of the other respondents. They place an overall lower importance on overall eating satisfaction.
  - Respondents who eat beef 1-2x/mo and 1-2x/wk are different than those who eat beef 3-5x/wk. Those who eat beef 3-5x/wk place a higher importance on overall eating satisfaction. According to their mean, they consider it “Very Important”
- Q16\_7- Please tell us how important the following attributes of local, pasture-raised beef are to you. Appearance of meat-color and texture
  - 1 is different than 5 and 6; 3 is different than 6
  - Respondents who eat beef <5x/yr are different than those who eat beef 3-5x/wk and >5x/wk. They consider appearance of meat-color and texture to be Moderately Important.
  - Similarly, those who eat beef 1-2x/mo are different than those who eat beef >5x/week.
  - Those who eat beef 3-5x/wk and >5x/wk consider appearance of meat to be Very Important.
- Q17\_1- What is your perception of local ranchers in regards to: Food production
  - 1 is different than 4,5,6

- Respondent who eat beef <5x/yr are different than those who eat beef 1-2x/wk, 3-5x/wk, and >5x/wk. While they all have a Positive perception of local ranchers in regards to food production, those who eat beef <5x/yr mean have a significantly lower mean than the others (borderline Neutral).
- Q17\_2- What is your perception of local ranchers in regards to: Environmental stewardship
  - 1 is different than 4,5,6
  - Respondent who eat beef <5x/yr are different than those who eat beef 1-2x/wk, 3-5x/wk, and >5x/wk. Those who eat beef <5x/yr have a Neutral perspective of local ranchers in regards to food production.
- Q17\_3- What is your perception of local ranchers in regards to: Animal welfare
  - 1 is different than 3,4,5
  - Respondent who eat beef <5x/yr are different than those who eat beef 1-2x/mo, 1-2x/wk, 3-5x/wk. Those who eat beef <5x/yr have a Neutral perspective of local ranchers in regards to animal welfare.

# **Appendix A**

## **Processor Questionnaire**



## Hawaii Cattlemen's Council, Inc.

### Hawaii's Local Beef Study

---

Start of Block: Default Question Block

#### Q1 Study Purpose:

The purpose of this study is to determine an initial framework for the quality standards to protect the integrity of Hawaii pasture-raised, grass-fed beef. The current official grade standards maintained by the USDA's Agricultural marketing Service is tailored to grain-finished beef.

As a processor, we are seeking your insight into the important production factors which could affect the quality of the pasture-raised, grass-fed beef produced and the needed improvements that would provide consistency of the product.

This survey is being conducted with funds from the State of Hawaii Department of Agriculture.

---

#### Q2 Name:

*(Internal use only)*

---

---

#### Q3 Please describe the scope of your company:

---

---



**Q4 What do you sell?**

*(Select all that apply)*

- ☐ Beef subprimals
- ☐ Beef trimmings for further processing
- ☐ Case ready items
- ☐ Portioned steaks/roasts
- ☐ Tenderized/enhanced beef products
- ☐ Beef variety meats/offal
- ☐ Beef carcasses
- ☐ Other: \_\_\_\_\_

Page Break

**Q5 Has your company purchased imported cattle or beef products (US or foreign) in the last 5 years?**

☐ Yes

☐ No

---

*Display This Question:*

*If Has your company purchased imported cattle or beef products (US or foreign) in the last 5 years? = Yes*

**Q6 Which country was it purchased from?**  
(Select all that apply)

- ☐ US Mainland
- ☐ Argentina
- ☐ Canada
- ☐ Mexico
- ☐ New Zealand
- ☐ Australia
- ☐ Brazil
- ☐ Uruguay
- ☐ Other: \_\_\_\_\_

---

Page Break

**Q7 Please indicate the types of beef products that your company/organization currently purchases:**  
(Select all that apply)

- ☐ Live cattle
  - ☐ Beef subprimals
  - ☐ Beef trimmings for further processing
  - ☐ Case ready items
  - ☐ Portioned steaks/roasts
  - ☐ Tenderized/enhanced beef products
  - ☐ Beef variety meats/offal
  - ☐ Beef carcasses
  - ☐ Other: \_\_\_\_\_
-

**Q8 Please indicate the volume of each type of beef product that your company/organization currently brings in per month:**

*(Please respond in the units indicated on each item)*

- ☐ Live cattle (# of head): \_\_\_\_\_
- ☐ Beef subprimals (lbs): \_\_\_\_\_
- ☐ Beef trimmings for further processing (lbs): \_\_\_\_\_
- ☐ Case ready items (lbs): \_\_\_\_\_
- ☐ Portioned steaks/roasts (lbs): \_\_\_\_\_
- ☐ Tenderized/enhanced beef products (lbs): \_\_\_\_\_
- ☐ Beef variety meats/offal (lbs): \_\_\_\_\_
- ☐ Beef carcasses (# of carcasses) \_\_\_\_\_
- ☐ Other (please indicate unit): \_\_\_\_\_

---

Page Break

**Q9 What does the term "weight and size" mean to your company/organization?**

*(Select all that apply)*

- ☐ Carcass weights
  - ☐ Uniformity in cuts
  - ☐ Appropriate ribeye size
  - ☐ Uniformity in cattle
  - ☐ Box weight
  - ☐ Other: \_\_\_\_\_
- 

**Q10 Provide any explanations about your "weight and size" responses here:**

---

---

**Q11 What does the term "cattle genetics" mean to your company/organization?**

*(Select all that apply)*

- ☐ Genetic potential for marbling
  - ☐ Angus
  - ☐ Predominantly black hided
  - ☐ Genetic testing/genetic markers
  - ☐ EPD's
  - ☐ Quality genetics
  - ☐ Other: \_\_\_\_\_
-

Q12 Provide any explanations about your "cattle genetics" responses here:

---

---

Q13 What does the term "visual characteristics" mean to your company/organization?  
(Select all that apply)

- ☐ Phenotypic attributes
- ☐ Muscling
- ☐ Amount of marbling
- ☐ Lean/trimmed product
- ☐ Appropriate product color
- ☐ No defects
- ☐ Other: \_\_\_\_\_

Q14 Provide any explanations about your "visual characteristics" responses here:

---

---

---

Page Break

**Q15 What does the term "food safety" mean to your company/organization?**  
(Select all that apply)

- ☐ Pathogen testing
  - ☐ Products/materials produced in effective food safety environment
  - ☐ No residues
  - ☐ No detectable E. Coli
  - ☐ Products/materials come from cattle that have pre-harvest interventions in place
  - ☐ Cooked to proper endpoint temperature
  - ☐ Hazard Analysis Critical Control Point (HACCP) Plan
  - ☐ Other: \_\_\_\_\_
- 

**Q16 Provide any explanations about your "food safety" responses here:**

---

---

**Q17 What does the term "lean, fat, and bone" mean to your company/organization?**  
(Select all that apply)

- ☐ Lean to fat ratio
  - ☐ Quality grade
  - ☐ Carcass weight and size
  - ☐ Yield grade 2's and 3's
  - ☐ Adequate muscling
  - ☐ Bone/structure
  - ☐ Genetics
  - ☐ Other: \_\_\_\_\_
- 

**Q18 Provide any explanations about your "lean, fat, and bone" responses here:**

---

---



**Q19 What does the term "eating satisfaction" mean to your company/organization?**  
(Select all that apply)

- ☐ Tenderness
  - ☐ Flavor
  - ☐ Customer satisfaction
  - ☐ Juiciness
  - ☐ Marbling
  - ☐ Overall palatability
  - ☐ Other: \_\_\_\_\_
- 

**Q20 Provide any explanations about your "eating satisfaction" responses here:**

---

---

---

Page Break

**Q21 What does the term "traceability" mean to your company/organization?**  
(Select all that apply)

- ☐ Ability to trace outbreaks
  - ☐ Ability to investigate issues
  - ☐ Age and source verified
  - ☐ Ability to trace to ranch
  - ☐ Farm to fork
  - ☐ Other: \_\_\_\_\_
-

Q22 Provide any explanations about your "traceability" responses here:

---

---

---

Q23 What does the term "sustainability" mean to your company/organization?

*(Select all that apply)*

- ☐ Environmentally friendly
- ☐ Using practices to keep current and future generations in business
- ☐ Sound business practices
- ☐ Triple bottom line: environmentally conscious, socially responsible, economically viable
- ☐ Products are received from sustainable suppliers
- ☐ Being mindful of replenishing herd size
- ☐ Sustainability is a plus but we don't have a policy for it in place
- ☐ Other: \_\_\_\_\_

---

Q24 Provide any explanations about your "sustainability" responses here:

---

---

**Q25 What does the term "animal well-being" mean to your company/organization?**

*(Select all that apply)*

- ☐ Animal handling
- ☐ Animal welfare
- ☐ Built-in characteristics of the product
- ☐ Animal comfort
- ☐ Animals are safe and have been provided with adequate nutrition
- ☐ Antibiotic use
- ☐ Other: \_\_\_\_\_

---

**Q26 Provide any explanations about your "animal well-being" responses here:**

---

---

---

Page Break



**Q27 Which of the following attributes of pasture raised beef are most important to your company/organization?**

*(Rank only your top 5 with 1 = Most Important)*

- \_\_\_\_\_ Weight/size
- \_\_\_\_\_ Cattle genetics
- \_\_\_\_\_ Visual characteristics
- \_\_\_\_\_ Food safety
- \_\_\_\_\_ Lean, fat, and bone
- \_\_\_\_\_ Eating satisfaction
- \_\_\_\_\_ Traceability
- \_\_\_\_\_ Sustainability
- \_\_\_\_\_ Animal well-being
- \_\_\_\_\_ How and where the cattle are raised
- \_\_\_\_\_ Other:

---

Page Break

**Q28 Does your company participate in, buy or sell branded beef products/programs?**

☐ Yes

☐ No

---

*Display This Question:*

*If Does your company participate in, buy or sell branded beef products/programs? = Yes*

**Q29 What scale of branded beef programs do you participate in?**

*(Select all that apply. Please list which program(s) your company/organization participates in the corresponding text box.)*

☐ National \_\_\_\_\_

☐ Regional \_\_\_\_\_

☐ Local \_\_\_\_\_

☐ Store \_\_\_\_\_

☐ Company specific \_\_\_\_\_

☐ Other: \_\_\_\_\_

---

Page Break

*Display This Question:*

*If What scale of branded beef programs do you participate in? (Select all that apply. Please list wh... = National*

**Q30 What are the specifications of the National-level program(s)?**  
(Select all that apply)

☐

Breed

☐

Size

☐

Weight

☐

Quality grade

☐

Natural

☐

Antibiotic free

☐

Source verified

☐

Age verified

☐

Locally raised

☐

Non-GMO

☐

Other: \_\_\_\_\_

---

*Display This Question:*

*If What scale of branded beef programs do you participate in? (Select all that apply. Please list wh... = Regional*

**Q31 What are the specifications of the Regional-level program(s)?**  
(Select all that apply)

☐

Breed

☐

Size

☐

Weight

☐

Quality grade

☐

Natural

☐

Antibiotic free

☐

Source verified

☐

Age verified

☐

Locally raised

☐

Non-GMO

☐

Other: \_\_\_\_\_

---

*Display This Question:*

*If What scale of branded beef programs do you participate in? (Select all that apply. Please list wh... = Local*

**Q32 What are the specifications of the Local-level program(s)?**  
(Select all that apply)

- ☐ Breed
- ☐ Size
- ☐ Weight
- ☐ Quality grade
- ☐ Natural
- ☐ Antibiotic free
- ☐ Source verified
- ☐ Age verified
- ☐ Locally raised
- ☐ Non-GMO
- ☐ Other: \_\_\_\_\_

---

*Display This Question:*

*If What scale of branded beef programs do you participate in? (Select all that apply. Please list wh... = Store*

**Q33 What are the specifications of the Store-level program(s)?**  
(Select all that apply)

- ☐ Breed
- ☐ Size
- ☐ Weight
- ☐ Quality grade
- ☐ Natural
- ☐ Antibiotic free
- ☐ Source verified
- ☐ Age verified
- ☐ Locally raised
- ☐ Non-GMO
- ☐ Other: \_\_\_\_\_

---

*Display This Question:*

*If What scale of branded beef programs do you participate in? (Select all that apply. Please list wh... = Company specific*



**Q34 What are the specifications of the Company Specific program(s)?**  
(Select all that apply)

- ☐ Breed
- ☐ Size
- ☐ Weight
- ☐ Quality grade
- ☐ Natural
- ☐ Antibiotic free
- ☐ Source verified
- ☐ Age verified
- ☐ Locally raised
- ☐ Non-GMO
- ☐ Other: \_\_\_\_\_

---

*Display This Question:*

*If What scale of branded beef programs do you participate in? (Select all that apply. Please list wh... = Other:*

**Q35 What are the specifications of the Other program(s)?**  
(Select all that apply)

- ☐ Breed
- ☐ Size
- ☐ Weight
- ☐ Quality grade
- ☐ Natural
- ☐ Antibiotic free
- ☐ Source verified
- ☐ Age verified
- ☐ Locally raised
- ☐ Non-GMO
- ☐ Other: \_\_\_\_\_

---

Page Break



**Q36 What does your company/organization believe the "strengths" of the pasture raised beef industry are?**

*(Rank your top 3 and use the corresponding text box to explain your response(s), as needed)*

- \_\_\_\_\_ Availability:
  - \_\_\_\_\_ Consistency:
  - \_\_\_\_\_ Consumer demand:
  - \_\_\_\_\_ Diversity of supply:
  - \_\_\_\_\_ Food safety:
  - \_\_\_\_\_ Marketing programs:
  - \_\_\_\_\_ Product quality:
  - \_\_\_\_\_ Taste:
  - \_\_\_\_\_ Other:
- 



**Q37 What does your company/organization believe the "weaknesses" of the pasture raised beef industry are?**

*(Rank your top 3 and use the corresponding text box to explain your response(s), as needed)*

- \_\_\_\_\_ Cost:
  - \_\_\_\_\_ Diversity:
  - \_\_\_\_\_ Food safety:
  - \_\_\_\_\_ Poor marketing:
  - \_\_\_\_\_ Product quality and specifications:
  - \_\_\_\_\_ Supply:
  - \_\_\_\_\_ Too fragmented:
  - \_\_\_\_\_ Other:
- 



**Q38 What does your company/organization believe are "potential threats" to the pasture raised beef industry are?**

*(Rank your top 3 and use the corresponding text box to explain your response(s), as needed)*

- \_\_\_\_\_ Activist groups:
  - \_\_\_\_\_ Animal disease:
  - \_\_\_\_\_ Bioterrorism:
  - \_\_\_\_\_ Cost:
  - \_\_\_\_\_ Federal regulation:
  - \_\_\_\_\_ Food safety:
  - \_\_\_\_\_ Public perception:
  - \_\_\_\_\_ Other:
-

**Q39 How important do you think it is to establish a standardized method for local beef products?**

- ☐ Not important
- ☐ Somewhat important
- ☐ Very important
- 

**Q40 Do you currently use a method to grade or sort your local beef products?**

- ☐ Yes
- ☐ No
- 

*Display This Question:*

*If Do you currently use a method to grade or sort your local beef products? = Yes*

**Q41 If so, what method do you use?**

*(Select all that apply)*

- ☐ Visual appraisal
- ☐ Marbling
- ☐ Color
- ☐ Age
- ☐ Shear Test
- ☐ Other: \_\_\_\_\_
- 

**Q42 What is the most difficult sub-primal or retail cut for your company to market locally?**

\_\_\_\_\_

---

Page Break

Q43

***Mahalo nui!***

***We appreciate your time and effort to help us improve our industry.***

Please click the advance arrow below to submit your responses.

End of Block: Default Question Block

---

## **Appendix B**

### **Producer Questionnaire**



## Hawaii Cattlemen's Council, Inc.

### 2019 Local Beef Producer Questionnaire

---

#### Start of Block: Default Question Block

Q1 The purpose of this study is to determine an initial framework for the quality standards to protect the integrity of Hawaii pasture-raised, grass-finished beef. Currently, there are no standards for grass-finished beef marketing. The current official grade standards maintained by the USDA's Agricultural Marketing Service is tailored to grain-finished beef.

The results of this survey will provide a framework for grass-finished beef quality standards. As producers, we are seeking your insight into the important production factors which could affect the quality of the pasture-raised, grass-finished beef produced and the needed improvements that would provide consistency of the product.

This survey is being conducted with funds from the State of Hawaii Department of Agriculture.

---

Q2 What is the name of your operation?

---

Q3 What is the size of your operation?

- ☐ Small (1-100 head)
  - ☐ Medium (101-500 head)
  - ☐ Large (501-1000 head)
  - ☐ X-Large (1001+ head)
-

**Q4 How long has your operation been in business?**

- ☐ < 10 years
- ☐ 10-25 years
- ☐ 26-50 years
- ☐ 51+ years

---

Page Break

**Q5 Where do you market the majority of your calves?**

- ☐ Local grass-finished market
- ☐ Breeding stock
- ☐ 4-H project animals
- ☐ Conventional feed lot - Sell at weaning
- ☐ Conventional feed lot - Retain ownership
- ☐ Other: \_\_\_\_\_



**Q6 What percentage goes to each?**

*(Total must equal 100)*

Local grass-finished market : \_\_\_\_\_

Breeding stock : \_\_\_\_\_

4-H project animals : \_\_\_\_\_

Conventional feed lot - Sell at weaning : \_\_\_\_\_

Conventional feed lot - Retain ownership : \_\_\_\_\_

Other: : \_\_\_\_\_

Total : \_\_\_\_\_

---



**Q7 Are you interested in increasing the number of animals you market locally?**

☐ Yes

☐ No

---

**Q8 What percentage of your total herd would you ideally target for the local market?**

☐ < 10%

☐ 11-25%

☐ 26-50%

☐ 51-75%

☐ 76-100%

---

**Q9 What barriers prevent you from marketing more cattle locally?**

*Select all that apply.*

- ☐ Limited acreage
  - ☐ Limited access to locally available forages/hay/feedstuffs
  - ☐ Limited markets
  - ☐ Food safety
  - ☐ Inconsistent quality
  - ☐ Potential for drought
  - ☐ Lower return on investment
  - ☐ Access to processor
  - ☐ Other: \_\_\_\_\_
  - ☐ Nothing. I market all of my cattle locally. *(If you choose this response, do not select any other option.)*
-

**Q10 Which of the following would be incentive(s) for you to market more of your cattle locally?**  
*Select all that apply.*

- ☐ Access to local markets
- ☐ Increased returns
- ☐ Interest in serving the local community
- ☐ Interest in food security
- ☐ Animal welfare
- ☐ Other: \_\_\_\_\_

---

Page Break

**Q11 Do you participate in any local-branded beef programs?**

- ☐ Yes
  - ☐ No
-

**Q12 If Yes, what are the specifications of the program(s)?**

*Select all that apply.*

- ☐ Breed
- ☐ Size
- ☐ Weight
- ☐ Natural
- ☐ Antibiotic Free
- ☐ Source Verified
- ☐ Locally Raised
- ☐ Grass Fed / Grass Finished
- ☐ Animal Welfare Certified
- ☐ Other: \_\_\_\_\_

---

Page Break

**Q13 Do you believe there is variability in the quality of local beef products?**

- ☐ Yes
- ☐ No

**Q14 How important do you think it is to establish a standardized method for local beef products?**

- ☐ Not important
- ☐ Somewhat important
- ☐ Very important

---

Page Break

**Q15 Do you currently use a method to sort/identify animals selected for the local beef market?**

☐ Yes

☐ No

---

**Q16 If Yes, what criteria do you use?**

*Select all that apply.*

☐

Visual appraisal

☐

Age

☐

Weight

☐

Genetics / Genomic tests

☐

Based on pasture conditions

☐

No specific criteria - whatever comes in that day

☐

Other: \_\_\_\_\_

---

Page Break

**Q17 What do you think are the most important production factors to consider when raising local beef?**

*Select all that apply.*

☐

Genetics

☐

Age

☐

Type of pasture

☐

Supplements

☐

Weight

☐

Animal welfare

☐

Animal nutrition

☐

Connection to consumer/community

☐

Food safety

☐

Food security

☐

Other: \_\_\_\_\_

**Q18 What is your feeding/supplement strategy for the beef cattle that you finish and market locally?**  
*Select all that apply.*

- ☐ Grass only; we don't supplement
- ☐ Hay, cubes, cake, or pellets
- ☐ Green chop or silage
- ☐ Brewer's or distiller's grains
- ☐ Mineral blocks
- ☐ Loose minerals
- ☐ Lick tubs
- ☐ Other: \_\_\_\_\_

---

Page Break

**Q19 What are your future plans relative to the next five years in terms of production levels?**  
*Select all that apply.*

- ☐ Keep animal numbers stable; no change
- ☐ Increase herd numbers
- ☐ Decrease herd numbers
- ☐ Retire / Get out of business

**Q20 Are there any additional thoughts you have on creating a standard for local, grass-finished beef?**

---

---

Q21

***Thank you for your response!***

(Clicking the advance arrow below will submit your response)

End of Block: Default Question Block

---



## **Appendix C**

### **Consumer Questionnaire**



## Hawaii Cattlemen's Council, Inc.

### Hawaii's Local Beef Study

---

Start of Block: Default Question Block

#### Q1 Study Purpose:

The purpose of this questionnaire is to understand consumer priorities when purchasing local, pasture-raised beef. Our ultimate goal is to determine an initial framework for the quality standards to protect the integrity of Hawaii pasture-raised, grass-fed beef. Your responses are an integral part of this process.

---

Page Break

#### Q2

##### Are you a resident or a visitor in Hawaii?

- ☐ Resident
- ☐ Non-resident home owner
- ☐ Visitor

*Skip To: End of Block If Q2 = Non-resident home owner*

*Skip To: End of Block If Q2 = Visitor*

#### Q3 How long have you lived in Hawaii?

- ☐ < 1 year
  - ☐ 1-5 years
  - ☐ 6-10 years
  - ☐ 11-25 years
  - ☐ 26+ years
-

**Q4 What is your age?**

- ☐ < 23 years old
  - ☐ 24-39 years old
  - ☐ 40-55 years old
  - ☐ 56-74 years old
  - ☐ 75+ years old
- 

**Q5 What is your gender?**

- ☐ Male
  - ☐ Female
- 

**Q6 Do you eat beef?**

- ☐ Yes
- ☐ No

*Skip To: End of Block If Q6 = No*

---

Page Break

---

**Q7 Approximately how often do you eat beef?**

- ☐ < 5 times per year
  - ☐ 5-10 times per year
  - ☐ 1-2 times per month
  - ☐ 1-2 times per week
  - ☐ 3-5 times per week
  - ☐ > 5 times per week
-

**Q8 What meat cuts do you buy most often?**

*(Select all that apply)*

- ☐ Ground beef
- ☐ Steak
- ☐ Thinly sliced beef (e.g., teriyaki, butayaki)
- ☐ Stew meat
- ☐ Beef for stir-fry, chopped steak
- ☐ Roast
- ☐ Brisket
- ☐ Variety meats (e.g., heart, liver, kidney, tongue, tripe, oxtail)
- ☐ Other: \_\_\_\_\_



**Q9 What drives your beef purchases?**

*(Rank your top 3 in order of importance with 1 being most important)*

- \_\_\_\_\_ Price
- \_\_\_\_\_ Cut
- \_\_\_\_\_ Local sourcing
- \_\_\_\_\_ Convenience of preparation
- \_\_\_\_\_ Quality
- \_\_\_\_\_ Consistency
- \_\_\_\_\_ Visual appearance - color/texture

---

Page Break

**Q10 Do you primarily purchase local, pasture-raised beef?**

- ☐ Yes
  - ☐ No
-



**Q20 Given all other factors being equal, please rank your preferences when purchasing beef.**

*(1 = First choice; 4 = Last choice)*

- \_\_\_\_\_ Local, grass-finished beef
- \_\_\_\_\_ Local, grain-finished beef
- \_\_\_\_\_ Imported, grass-finished beef
- \_\_\_\_\_ Imported, grain-finished beef

*Display This Question:*

*If opp = jesse*

**Q11 Given an equal price, would you purchase local, pasture-raised beef over imported beef?**

- ☐ Yes
- ☐ No

*Display This Question:*

*If opp = jesse*

**Q12 Given an equal price, would you purchase local, pasture-raised beef over grain-fed beef?**

- ☐ Yes
- ☐ No

**Q11, 12, 14, & 20 NOTE:**

As a reminder, Qs 11 and 12 were asked during the soft launch. They did not return suitable/meaningful data. Q20 was written to replace those two questions for the full launch.

After the soft launch, Q14 was moved to precede Q13 to facilitate flow in the questionnaire.

Page Break

**Q14 What does the term "eating satisfaction" mean to you when eating beef?**

*(Select all that apply)*

- ☐ Tenderness
- ☐ Flavor
- ☐ Juiciness
- ☐ Marbling
- ☐ Overall palatability

**Q13 Does local, pasture-raised beef consistently satisfy your expectations for a desirable eating experience?**

☐ Yes

☐ No

---

**Q15 A quality grade helps consumers understand the eating satisfaction of a product (e.g., prime, choice, etc.).**

**If local, pasture-raised beef products were assigned a quality grade, would that help drive your decision making?**

*(Please use the corresponding text box to explain your response)*

☐ Yes (if so, why?) \_\_\_\_\_

☐ No (if so, why not?) \_\_\_\_\_









---

Page Break

**Q16 Please tell us how important the following attributes of local, pasture-raised beef are to you.**

*1 = Not important; 2 = Low importance; 3 = Neutral; 4 = Moderately important; 5 = Very important*

1                      2                      3                      4                      5




How and where the cattle are raised	
Food safety - knowing beef is wholesome, free of disease-causing agents	
Overall eating satisfaction	
Natural label - never been treated with antibiotics or added hormones	
Grass-fed label - fed 90% or more on pasture	
Locally sourced - Hawaii born and raised	
Appearance of meat - color and texture	
Branded product (recognized label indicating a Hawaii-specific producer)	

---

Page Break

**Q17 What is your perception of local ranchers in regards to:**

*1 = Very negative; 2 = Negative; 3 = Neutral; 4 = Positive; 5 = Very positive*

	1	2	3	4	5
Food production					
Environmental stewardship					
Animal welfare					

---

Page Break



**Q18 Please rank your preference of protein(s) in the marketplace.**

*(You may rank from 1 to 6 items. Please rank from 1 being most preferred.)*

- \_\_\_\_\_ Beef
- \_\_\_\_\_ Poultry
- \_\_\_\_\_ Fish
- \_\_\_\_\_ Pork
- \_\_\_\_\_ Lamb/Mutton
- \_\_\_\_\_ Plant-based meat alternatives

---

Page Break

Q19

**Mahalo nui!**

**We appreciate your time and effort to help us improve our industry!**

**Please click the advance arrow below to submit your responses.**

End of Block: Default Question Block

---