CTAHR
Beef Initiative
Impact and Final Report

2007–08 Cumulative Accomplishments

College of Tropical Agriculture and Human Resources
University of Hawai'i at Mānoa

The founding college of the University of Hawai'i, established 1907

Contents

Impacts and Benefits to the Hawai‘i Beef Cattle Industry

CTAHR’s Beef Initiative Program, 2004–08

Grants Dollars Leveraged and Total Publications

- 24 total grants and $1,413,780 additional dollars received
- 21 CTAHR publications, 7 national abstracts, 3 journal articles

Sustaining Ranching Communities Strategic Plan

The CTAHR Beef Initiative Program team played a pivotal role in coordinating, developing and documenting the 2007 Hawai‘i beef strategic plan by partnering with the beef cattle industry. The plan will be critical in providing a roadmap for the members in discussing and developing long-term solutions to effectively protect this sector of Hawai‘i’s struggling livestock industries. The plan is a part of a report entitled “Protecting the Livestock Industry in Hawai‘i” presented to the 2008 Hawai‘i State Legislature by the Hawai‘i Department of Agriculture.

Economics and Marketing (CTAHR publications: 5)

The CTAHR Beef Initiative Program led off with this focal project to develop Paniolo-XL, an integrated model customized for Hawai‘i conditions with consistent format as a user-friendly tool for ranchers to analyze their business management decisions. The Calf-XL cost-of-production calculator is in use and has been endorsed by the 2007 Hawai‘i beef strategic plan. Beef-XL and Ranch-XL are currently being field-tested. The final comprehensive tool being developed, called Paniolo-XL, is a complete package of beef ranch programs, including Calf-XL (cost of production), Beef-XL (marketing analysis), and Ranch-XL (financial management), for use in ranch business planning.

Value-Added Technologies (CTAHR publications: 1, national abstract: 1)

Focus on the flexible retort pouch (FRP) technology has driven the interest by the beef cattle industry to utilize sub-prime cuts of beef to produce a high-value product with long shelf life and consistent quality. CTAHR researchers developed prototype products and have initiated the process of recipe and business plan development with industry stakeholders. A food production systems study identified the strategy of FRP technology for beef as one of the top 12 viable alternatives for food sustainability in Hawai‘i.

Pastoral System (CTAHR publications: 11, journal publications: 3, national abstracts: 2)

Best management practices for improvement of former sugarcane lands were developed from pasture-improvement research conducted through the Beef Initiative Project and are being adopted by producers on Maui, Kaua‘i, Moloka‘i, and Hawai‘i. In addition, USDA Natural Resource Conservation Service personnel have adopted these practices for pasture conservation plans they develop for livestock producers across the state. As a result of the adoption and implementation of these recommendations, former sugarcane lands have been improved for sustainable forage production. Other research under way includes focus on forage-finished beef production.

A number of publications and articles in the Annual Mealani Forage Field Day Proceedings are focused on helping producers manage their pasture lands better and more economically. The new Hawai‘i Grazing and Livestock Management Academy program conducted three statewide sessions for a total of 68 producers and federal and state land management personnel and has generated additional interest, growing to multi-state partners in the Western Pacific and development of a Phase II curriculum.

Increasing forage production though pasture improvement and better management will reduce the industry's reliance of imports, reduce feed costs, increase carrying capacity for beef production, maintain agricultural landscapes and open space, and provide jobs in rural communities. The 2007 Hawai'i beef strategic plan identified land-base policies as a critical component of the industry's success. Continued long-term investment in research to improve the productivity of forage and pastoral systems is critical to sustaining livestock production in Hawai'i.

Genetics and DNA Technology (CTAHR publications: 9, national abstracts: 2)
CTAHR's beef research in genetic selection by DNA and ultrasound technology will make Hawai'i a leader in the development of superior genetics for grass-based production for our industry and other tropical regions of the Pacific Basin. Marketing opportunities are driving this change for improved genetics "from pasture to plate," and Hawai'i's producers are poised to make use of this valuable technology. A cooperative project with several Hawai'i ranchers is in progress to assist in the selection of market-driven genetic traits and validation of carcass data, with an ultimate goal of developing technologies to identify production efficiency and carcass traits for tropical ecosystems. In conjunction with the research project, extension agents conducted statewide ultrasound technology workshops and trained 27 artificial insemination technicians to complement the beef genetic improvement focus.

Meat Science and Technology (CTAHR publications: 5, national abstracts: 2, international abstracts: 1)
CTAHR research and outreach efforts in the meat sciences over the past decade have made significant impact on the 100% Hawai'i-Grown Beef market. As a result,

- low-voltage electrical stimulator technology for carcass tenderization was introduced
- the benefits of needle tenderizing technology were evaluated
- the healthy fatty acid profiles in grass-finished beef were analyzed and confirmed
- labeling to assist consumers in identifying Hawai'i beef was developed
- the quality and tenderness of grass-finished beef in the marketplace was evaluated, published and serves as a benchmark for product enhancement.

CTAHR faculty will continue to work with Hawai'i producers in improvement and refinement of beef quality through best management practices focusing on providing tender, locally produced beef.

Outreach Education (CTAHR publications: 7)
CTAHR extension faculty developed original and innovative educational outreach programs for producers and the livestock community that have been emulated in other parts of the country. Mealani's annual Forage Field Day and A Taste of the Hawaiian Range food festival are the educational centerpieces of the college's beef outreach program and have created market awareness of the quality of beef and other forage meats and vegetable and fruit crops in Hawai'i. The CTAHR Beef Initiative Program enhanced these programs by providing additional funds for speaker invitations and statewide coverage of additional workshops. Since its inception in 1996, nearly 700 ranchers have participated in the educational field day and more the 10,000 people have learn about Hawai'i agriculture at the festival. Since 2003, participants came from 43 different states and 7 foreign countries to participate in this CTAHR community event.

In addition, the program has brought knowledge and appreciation about Hawai'i's vibrant agriculture sector to its citizens and visitors. Many farmers and ranchers have since develop merchandising tools for their operation and expanded their direct-marketing efforts to local chefs and resorts.

Introduction

Aloha! This is the CTAHR Beef Initiative Program final update report to the Hawai‘i beef cattle industry, as funding for the program ends in fall 2008. As team leader, I believe that the CTAHR team of researchers, extension specialists, extension agents, research station technicians, and research support staff has made many significant contributions to the beef cattle production knowledge base. On behalf of all team members, I would like to acknowledge the individual ranchers who cooperated with the team on various projects and extend thanks to all industry participants in our outreach programs and to cooperating agencies for their respected partnerships and participation in this four-year effort. We hope to keep the team involved in continued interaction with the beef industry through specific funded project areas, and we hope for broader funding to continue supporting research and outreach efforts for the Hawai‘i beef cattle industry.

Special acknowledgment goes to CTAHR Dean Andrew Hashimoto for his belief in and vision for the Hawai‘i beef cattle industry and for entrusting to our team the task of delivering meaningful outputs and adoptable outcomes for tropical and subtropical livestock production systems. Institutional measures of success are tabulated by grant dollars leveraged and publications generated. I believe this program has been tremendously successful, as the team has received additional grant funds of more than $1.41 million dollars ($4.36 leveraged for each dollar of initial seed funding); produced three journal articles, seven national abstracts, and 21 CTAHR publications; and made more than 25 national and statewide presentations.

The CTAHR team of researchers and extension educators encourage you to review our cumulative accomplishments from the winter of 2004 to the winter of 2008. We welcome input, comments, and suggestions from the individuals and communities we serve through this program. Please visit our website at www.ctahr.hawaii.edu/paniolo.

Mahalo,
Glen K. Fukumoto
Team Leader, CTAHR Beef Initiative Program

Our vision: Hawai‘i will be the leader in tropical and subtropical cattle and forage production systems.

Objectives

The CTAHR Beef Initiative is a major endeavor and commitment by the University of Hawai‘i at Mānoa’s College of Tropical Agriculture and Human Resources to partner with the Hawai‘i beef industry to stimulate growth, economic diversification, and environmental sustainability for agriculture in Hawai‘i. The beef industry will continue to be a leader for the vision of pastoral livestock agriculture in Hawai‘i and remain an important contributor to diversified agriculture, the state’s economy. and Hawai‘i’s cultural heritage.

The objectives of the program are to improve the competitiveness, profitability, and sustainability of the beef industry by

- developing and implementing effective research and innovative extension programs for animal production in Hawai‘i and other tropical regions
- improving communications among the beef industry, interagency partners, and CTAHR
- supporting the industry on legislative and other governmental issues, policies, and partnerships.

Special Feature

Sustaining Ranching Communities Strategic Plan

Investigator: Glen Fukumoto

Master facilitator Dr. Donna Ching addresses Hawai'i beef cattle industry members during a strategic planning retreat held in summer 2007.

This is a critical time for the survival of the livestock industries in Hawai'i. Many issues and concerns play into this dilemma. Since the decline of the once-dominant plantation-based industries, agricultural lands lost ground and saw conversion of thousands of acres to non-agricultural uses. Food production and security is one on the most important components of an island ecosystem. Realizing this, the 2007 Hawai'i Legislature requested that the Hawai'i Department of Agriculture establish a task force to discuss and develop long-term solutions to protect the livestock industry in Hawai'i. As part of this effort, in partnership with the beef cattle industry and allied agencies, the CTAHR Beef Initiative Program team played a pivotal role in coordinating, developing, and documenting the section entitled "Strategic Plan—Sustaining Ranching Communities in Hawai'i," which can be found at www.hicattle.org (scroll down at the home page and select Strategic Plan). The plan is part a of report entitled "Protecting the Livestock Industry in Hawai'i" presented to the 2008 Legislature by the Hawai'i Department of Agriculture.

The two-day strategic planning retreat included 67 industry members and state and federal agency and university personnel. The outcomes of this retreat, facilitated by Dr. Donna Ching, were the Hawai'i Ranching Community Vision Statement and three implementation strategies. The plan provides a roadmap for its members in discussing and developing long-term solutions to effectively protect this sector of Hawai'i's struggling livestock industry.

Vision

Hawai'i's beef cattle industry will continue to play a vital role in sustaining Hawai'i's agricultural and economic bases and the ecosystem service values that make Hawai'i so unique.

Strategies

1. Advocate public policies that support economic sustainability of grazing and other compatible managed open space uses.
2. Ensure both local and out-of-state markets and production opportunities with economically viable transportation alternatives.
3. Educate the general public (including our children), policy makers, and stakeholders on issues critical for the survival of the beef industry in Hawai'i.

Economics and Marketing

The Bottom Line of Ranching Economics

Investigator: Linda Cox

Objectives

1. Estimate the costs and benefits of various production and marketing strategies available to beef producers.
2 Assemble an expert-choice model that producers can use to evaluate their options.

Activities, Progress, and Results

The beef industry, as part of a strategic planning effort, formed a committee to investigate various methods that could be used to calculate the cost of producing calves in Hawai‘i. The group concluded that Calf-XL was the best option available for this purpose.

A survey of ranchers was completed in September 2007 to estimate benchmark information for the cost of producing a calf. The sample used was representative across three different herd sizes of 0–250 head, 251–1000 head, and over 1000 head. The response rate was low, with four responses in the 1–250 category, two in the 251–1000 category, and three in the over 1000 category.

A weighted average for cash costs with depreciation for producing a pound of calf was calculated by multiplying the cost for each ranch by the herd size, adding across all ranches, and dividing by the total hard size across all ranches. The weighted average for producing of pound of calf is $1.03, and the range across all ranches is $0.59 to $1.87.

Looking at the correct part of the equation is important in analyzing the economics of your operation. On-ranch workshops offer opportunities for ranch managers, paniolo, and extension personnel to work and learn together, creating professional and personal relationships.

There is wide variation in the cost to produce a pound of calf. Small ranches are not as profitable as medium or large ranches. Medium sized ranches appear to realize some economies of scale, while large ranches do not appear to be faced with additional costs as compared to medium sized ranches. This may be because large ranches appear to have very few unpaid employees, and paying labor out-of-pocket increased cash expenses.

The profit margins for cow-calf operators are very tight, and the majority of the ranchers surveyed would face challenges in covering the opportunity cost of their labor and capital investment. However, if additional value-added beef products can be found that increase revenues, the situation can be greatly improved.

At the same time, ranchers face significant costs in acquiring the use of pastures, both in out-of-pocket costs and in opportunity costs, and any reduction in these costs would increase profitability. Transportation expenses, including gas, and veterinary expenses are also large out-of-pocket expenses for ranchers. While it may be challenging to reduce these, possibilities may exist.

The collection and dissemination of the valuable benchmark information represents a large shift in the managerial behavior of industry members. Previously, the collection and dissemination of such benchmark data was not a top priority for the industry. Training workshops for Calf-XL are being scheduled for the industry, to further extend this decision-making tool.

The second draft of Beef-XL is in preparation to incorporate changes identified in the initial piloting process. The first draft of Ranch-XL, which is needed to complete Paniolo-XL, is now in preparation and pilot testing.

Report Summary

The beef industry concluded that the collection of benchmark information on the cost of producing a calf is a top priority and endorsed Calf-XL as a management decision tool to be used in the collection of this information. A survey of ranchers was completed, and it was concluded that the profit margins for cow-calf operators are very tight. Ranchers face significant costs in acquiring the use of pastures and transportation expenses. Beef-XL and Ranch-XL are being finalized to complete Paniolo-XL.

Value-Added Product Development

Flexible Retort Pouch Technology Identified as Profitable Opportunity

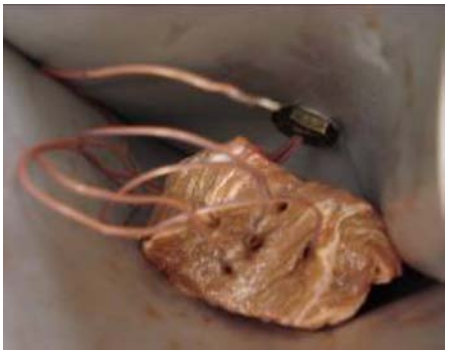
Investigators: Linda Cox, Soojin Jun, Alvin Huang

Objective

1. Investigate methods for adding value to the less desirable cuts of beef.

Activities, Progress, and Results

Preliminary development work with beef products using flexible retort pouch (FRP) technology has been encouraging. Stakeholders participating in three beef sampling events using FRP prototypes gave favorable reviews; preparations were positive for tenderness, flavor, and texture. A small committee was established to investigate recipe development with complimentary Hawai‘i agricultural products and brand development. Discussions identified major challenges for business expansion of the technology and product development; limitations include funding for the scaling-up of equipment to begin commercial production requirements and the development of business agreements that would meet the needs of all the stakeholders.



Adding value to traditional ranch cuts of beef the old-fashioned way (top) and through new technology (bottom).

The FRP technology was identified as one of the top 12 promising opportunities out of a total of 40 potential Hawai‘i agriculture and food system businesses in the Hawaii Island Whole System Project conducted by the Rocky Mountain Institute (Snowmass, Colorado) in 2007. These top opportunities identified businesses and ideas that promote innovation and local self-reliance, according to the report.

The retort pouches can withstand thermal processing temperatures and combine the advantages of both metal cans and plastic packages. The FRP technology reduces costs and labor by eliminating the aseptic pre-processing of the meat product. The raw beef used in the retort pouch was vacuum-sealed and heat-treated at 121°C for various holding times using a static retort system. The palatability of FRP beef was evaluated by quantitative measurements of shear force and drip loss, as well as sensory panel evaluation tests. The associated operating parameters recorded were holding time, pressure, and ingredients. The use of k-Carrageenan to absorb drip or water loss from beef during retort processing caused no significant effect on beef flavor, according to the sensory evaluation. To evaluate for product sterility, multiple internal temperature probes were positioned at different locations in the meat sample to ensure that proper minimum temperatures were reached. The 3D heating patterns of beef samples in

packaging under pressured environments was modeled using the computational fluid dynamics (CFD) codes. Results from food engineering research show that the mix of a numerical technique and the experimentally determined meat values will yield a successful model to optimize the operating parameters of the FRP technology for beef products.

Report Summary

Based on the criteria outlined in the RMI report, the potential for success of FRP technology to add value to Hawai‘i beef products remains high. The technology is consistent with existing conditions in the Hawai‘i beef market but will require a long-term commitment of human and financial resources from industry stakeholders. The specific reference to the FRP technology as a means of adding value to the Hawai‘i beef industry can be found on pages 76–77 and 81–82 of the RMI report.

Reference

Page, C., L. Bony, and L. Schewel. 2007. Island of Hawaii Whole System Project, Phase 1 Report Rocky Mountain Institute, Snowmass, Colorado.
http://learning.kohalacenter.org/resource/resmgr/pdf/hi_wsp_2.pdf

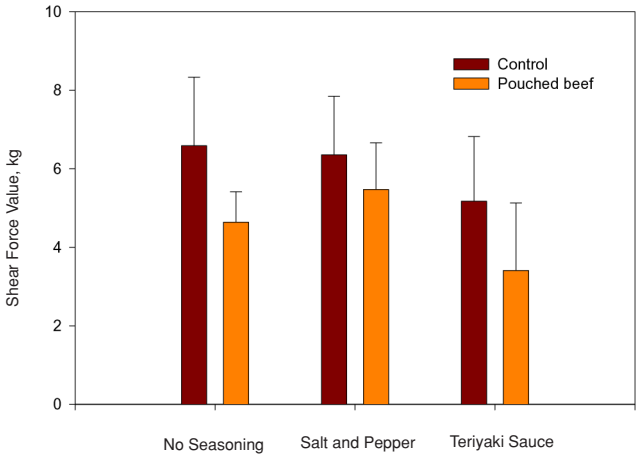


Figure 1. Tenderness (or shear force) of the flexible retort pouch seasoned preparations compared to standard laboratory preparation (water bath technique). FRP processing improved the tenderness of the meat (chuck) used in the study.

Saving the pre-cooking step in processing, raw meat products can be processed directly with flexible retort pouch technology and still maintain product integrity and shelf life.

Pastoral Systems

Investigators: Mark Thorne, Linda Cox, Jonathan Deenik, Harold Keyser, John Powley, Michael DuPonte, Glen Fukumoto, Lincoln Ching, Eileen Herring

Activities, Progress, and Results

Best Management Practices for the Remediation of Former Sugarcane and Pineapple Lands for Sustainable Livestock Production in Hawai‘i

Mark Thorne, Linda Cox, Jonathan Deenik, Harold Keyser

Work on this project, detailed in previous Beef Initiative reports, continued through 2007 with additional vegetation samples collected in February, June, and October. Final soil samples at the sites were collected in December 2007. The final vegetation samples are currently being analyzed. Soil analyses 6 months post-treatment indicated that the soil pH and fertility was significantly improved in the treated plots relative to the control plots. Total forage production was two and three times greater in the low- and high-N treatments relative to the control. Production rates at the Kaua‘i site were twice those at the site on Hawai‘i. Cattle offered free-choice access to half of the research blocks grazed almost exclusively in the high- and low-N treated plots (75 and 60 percent utilization, respectively), while utilization of the untreated plots was less than 20 percent of the available forage.

This project was supported through the USDA-Tropical and Subtropical Agricultural Research Program ($262,013) and a USDA-CSREES Integrated Project grant ($50,000).

Hawai‘i Animal Performance and Forage Production Profiling Project

Mark Thorne

Forage quantity and quality are major limiting factors for the sustainable production of grazing animals. The quantity and quality of grazed forages is primarily a function of the species composition of the pasture, soil quality, and climatic conditions including amount and timing of precipitation, growing degree days, amount of photosynthetically active radiation, and relative humidity. In addition, past and current grazing impacts greatly affect forage quality and quantity. For the beef industry to remain sustainable in Hawai‘i, a better understanding of the soil-plant-animal interactions common in tropical and subtropical pasture systems is needed.

The primary goal of this project was to correlate various animal nutrition and performance indicators with key forage production values. These associated indicators, or profiles, will help producers make proactive decisions about their management practices, allowing them to make changes rapidly without affecting animal performance. The objectives of this study were to (1) determine the relationship between animal performance indicators (BCS, rate of gain, hair coat length) with tropical forage quality and quantity measures; (2) determine the effects of season and intensity of solar radiation on the photosynthetic rate of tropical forage grasses; and (3) quantify and characterize the changes in forage quality with changes in growing season, solar intensity, and age of regrowth.

This project was conducted in collaboration with the USDA-Natural Resources Conservation Service and the Mealani Experiment Station. The fieldwork on this project was completed in June 2007. Currently, the data are still being analyzed and reports and publications are still being prepared. The results of

CTAHR investigators pause for a break between harvesting plots of a T-STAR–funded project.

this project will provide valuable information to Hawai‘i livestock producers for adopting sustainable grazing management practices. Specifically, the results will provide information on grazing management strategies that help producers maintain high levels of forage quality and quantity throughout the production year in their pasture systems, information that has been very limited. The results of this project will be broadly applicable across the diversity of livestock operations in Hawai‘i including not only cow-calf producers but also stocker-finisher and seed-stock operations. This project resulted in a preliminary publication presented at the Mealani Forage Field Day Program.

Funding ($17,110) for this two-year project was provided by the USDA-NRCS.

Pyrrolizidine Alkaloid Content of Fireweed (Senecio madagascarensis) in Hawai‘i

Mark Thorne, Jonathan Deenik, Tomoaki Muira, John Powley, Glen Fukumoto

Fireweed is one of more than 1200 species of Senecio distributed throughout the world. It is a native of Madagascar and South Africa that became established in Hawai‘i in the early 1980s. Today the weed is widespread on the islands of Maui and Hawai‘i, infesting vast acreages of pasture, rangelands, and roadsides. In some parts of those islands, up to 60 percent of the vegetative cover is fireweed. In such areas, forage production is estimated to be reduced by as much as 40 percent. An individual plant can produce up to 30,000 seeds, and the seeds can remain viable for as long as 50 years. Only 25 species of Senecio are proven to be toxic to animals. Most of the available information on the principal toxins, pyrrolizidine alkaloids, in these Senecio species is from studies on tansy ragwort, threadleaf groundsel, and Ridell’s ragwort. Although evidence is limited, it is strongly suspected that fireweed may also be toxic to animals.

Because of its proliferation and possible linkage to animal deaths in Hawai‘i, work began on a small series of investigations into the distribution, abundance, and pyrrolizidine alkaloid (PA) content in fireweed; the study was in collaboration with Dr. Dale Gardner of the USDA-ARS Poisonous Plants Research Laboratory in Logan, Utah. These investigations revealed that fireweed plants in Hawai‘i contain 10 different PA compounds. The relative concentration of these PA compounds varied with elevation and soil fertility. This investigation resulted in two publications, a workshop presentation, and an educational poster presented at the 2008 joint meeting of the Society for Range Management and the American Forage and Grassland Council.

Through the initial work, it was evident that there was a need for further, more in-depth studies on the

biology and ecology of fireweed in Hawai‘i. Subsequent funding has been awarded through the Maui County Research and Development Program ($34,056) and the Hawaii Farm Bureau Federation Research and Market Development Program ($40,000) for further fireweed research. This new project began in September 2007 with the following objectives: (1) document the distribution and rate of spread of fireweed on Hawai‘i and Maui utilizing aerial photography or satellite imagery; (2) quantify physiologic and morphologic characteristics of individual plants (including PA concentrations, photosynthetic rates, percent cover, etc.) within and between populations across elevation, climate, and soil gradients; (3) explore possible linkages between soil types and factors contributing to 1 and 2; and (4) develop best management practices for the control of fireweed for landowners based on results from 1, 2, and 3.

Hawai‘i Rainfall and Forage Production Index Project

Mark Thorne

Sustainable livestock production is dependent on reliable forage resources that will maintain animal health and reproductive fecundity. However, the temporal and spatial variation in forage production in range and pasture lands makes effective grazing management decisions difficult. The temporal and spatial variation in forage production in most range and pasture systems is closely linked to the timing and amount of precipitation. Livestock producers often make grazing management decisions based on past or average forage production levels with little or no certainty that a sufficient amount of precipitation will occur in time to produce what they are counting on. Thus, while during normal precipitation years there is adequate forage to maintain herd productivity, forage resources are wasted when precipitation exceeds long-term averages. On the other hand, overgrazing can result during drought years if herd numbers are not adjusted accordingly.

While globally derived mean annual precipitation (MAP) and annual net primary production (ANPP) functions are useful in developing a general understanding of the relationship between forage production and precipitation, they are of limited use for making management decisions because they are not locally derived. In short, globally derived MAP and ANPP functions cannot account for temporal and spatial precipitation patterns, which have as much influence over forage production as total annual precipitation does. For example, summer forage production in most range and pasture systems is dependent on spring precipitation. If spring precipitation is below normal, there is a high probability that forage production for the summer grazing period will be less than average. This relationship has been used to forecast forage shortages in several regions of the continental United States in order to prevent severe livestock losses. Thus, development of MAP and ANPP functions that account for temporal and spatial patterns in precipitation inherent to a given local greatly improves the management decision process.

The overall purpose of this project is to quantify the relationship between local precipitation patterns with forage production. These data will be used to develop locally significant MAP and ANPP functions that will be useful for pro-active management of range and pasture lands in Hawai‘i. This project seeks to unite resource production potentials with conservation planning efforts on range and pasture lands.

The specific objectives of the project are to

- establish a network of low-cost precipitation gauges and forage exclosures within each county in the state of Hawai‘i
- monitor and collect rainfall and forage production data at each station for a minimum of three years
- develop a Rainfall and Forage Production Index that accurately reflects the influence of seasonal and annual variations in precipitation on range and forage resources across a variety of spatial scales (i.e., pasture, precipitation zone, county, state, etc.)

- develop a Decision Support Tool and related publications for dissemination and use by producers and state and federal agency personnel (USDA-NRCS, FSA, etc.) to assess the impact of drought on range and forage resources and ranch economics.

Information gained from this project will be transferred to field offices and the public via USDA-NRCS field office technical guides, in ecological site descriptions, and through CTAHR's Cooperative Extension Service. This project is funded through a USDA-Natural Resources Conservation Service Conservation Initiative Grant ($73,334). In addition, this project has been endorsed by the Farm Service Agency for development of a tool that will facilitate the Noninsured Crop Disaster Assistance Program (NAP-Forage) they administer.

Survey of the Natural Resources, Fine-Fuel Loads, and Extent of Fountain Grass Invasion on Rangelands in the Pu‘uwa‘awa‘a Area of West Hawai‘i

Mark Thorne

Responsibility for state-managed lands within the ahupua‘a of Pu‘uwa‘awa‘a and Pu‘uanahulu was recently transferred from the Department of Land and Natural Resources' Land Division to its divisions of Forestry and Wildlife (DOFAW) and State Parks. Subsequently, DOFAW and State Parks worked with the Pu‘uwa‘awa‘a Ahupua‘a Advisory Council to develop a management plan for approximately 40,711 acres within the Pu‘uwa‘awa‘a and Pu‘uanahulu areas. Both the Pu‘uwa‘awa‘a Advisory Council and state land management personnel recognize that additional research and resource management initiatives are required to effectively conserve and manage these lands.

In order to address the grazing priority in the Pu‘uwa‘awa‘a Management Area, the Pu‘uwa‘awa‘a Advisory Council appointed a Grazing Management Committee to develop a grazing management plan. The primary focus of this plan will be to mitigate the effects of wildfire resulting from the well established and growing stands of fountain grass within Pu‘uwa‘awa‘a. To accomplish this, the plan will require a reduction in available fountain grass biomass by as much as 65 percent annually using sound grazing management practices. In order to develop such a plan, however, more information is needed regarding the distribution and productivity of fountain grass within the Pu‘uwa‘awa‘a Management Area. In addition, a survey of resources that may either support or need protection from animal grazing needs to be conducted. These data are critical to the development of a successful grazing management plan.

The purpose of this project is to conduct a detailed survey of the Pu‘uwa‘awa‘a Management Area documenting critical natural resources, fine-fuel load levels resulting from fountain grass biomass, and the extent of fountain grass invasion. This information is critical to the success of the grazing management plan being developed for the area, because it will provide baseline data from which the committee will be able to determine the ideal grazing management practice to be used in any given pasture in Pu‘uwa‘awa‘a. Specifically, the data from this project will allow estimates of baseline stocking rate values and desired grazing intensity by pasture, seasonal grazing rotation plans in critical areas, and recommendations on the kind and class of animal most suited to graze a particular area. With the data gathered from this project, a grazing management plan will be developed that will reverse the current trend and spread of fountain grass into the Pu‘uwa‘awa‘a Management Area and reduce the standing biomass and fine-fuel loads that currently threaten the region. Finally, the data from this project will be used to establish permanent monitoring sites for the purpose of monitoring pasture condition and trends in forage production, fine-fuel loading, fountain grass distribution, and native tree species recruitment.

The specific objectives of this project are to

- document critical natural resources within each pasture of the Pu‘uwa‘awa‘a Management Area including natural resources that support sustainable grazing management and natural resources that need protection from grazing
- document the current distribution and amount of fountain grass fuel and forage within the Pu‘uwa‘awa‘a Management Area
- establish permanent monitoring sites in key use areas within the Pu‘uwa‘awa‘a Management Area for monitoring long-term trends in pasture condition, forage production levels, fine-fuel loads, distribution of weeds, and native and exotic vegetation dynamics including tree, shrub, and herbaceous species recruitment.

The information from this project will be incorporated into the Pu‘uwa‘awa‘a Management Area Grazing Management Plan. In addition, the information will be incorporated into educational materials and workshops on the natural resources of Pu‘uwa‘awa‘a and management practices being used there. Educational materials on the extent of the fountain grass invasion, the fire danger it presents, and methods of reducing those dangers will also be produced and disseminated to the general public. This project is funded ($86,241) by the West Hawai‘i Wildfire Management Organization.

Rangelands West Partnership (WERA-1008) and the Hawai‘i Rangelands Website

Mark Thorne, Eileen Herring, Glen Fukumoto

A Western Rangelands Partnership began when attendees of the 2001 Land Grant Colleges of Agriculture Western Regional Joint Summer Meeting and members of the Western Council for Agricultural Research, Extension, and Teaching (CARET) expressed interest in an AgNIC rangelands website created in 1995 by the University of Arizona. A regional effort began in 2002 to expand the initial website to cover the entire western United States. The first regional workshop, held in 2002, brought together range specialists and librarians from 12 western land grant universities. Today there are 18 member universities, including the University of Hawai‘i, each with a rangeland website specific to their state. Hawai‘i joined the partnership in 2004. Eileen Herring, UH agricultural librarian, and Mark Thorne developed Hawai‘i’s website and brought it online in early 2004. Hawai‘i’s rangeland website can be accessed at http://rangelands.manoa.hawaii.edu.

The Rangelands West Partnership became a Multistate Research Project in January 2006 as WDC-1, with the final designation of WERA-1008. Hawai‘i’s website is the only one of the 18 member sites that provides information on the ecology and management of tropical and subtropical rangelands. Thus, not only does this website provide a valuable resource for land managers in Hawai‘i, it also provides a valuable perspective to students, researchers and others who are interested in the ecology and management of tropical and subtropical rangelands.

The Rangelands West Partnership was awarded a WSARE Grant in July 2004 entitled Building Knowledge of Sustainable Rangeland Management Using Information Technology. Each participating partner was awarded $4,000 to conduct surveys of producers, extension agents, and land management professionals in their respective states, send up to two individuals to a training conference held in Boise, Idaho held in November 2005, and develop a sustainable rangeland management module on the state website. In Hawai‘i, 12 individuals participated in interviews, and two participants, one rancher and one soil conservationist from USDA-NRCS, were sent to the conference.

Genetics and DNA Technology

Investigators: Jinzeng Yang, Michael DuPonte, Marla Fergerstrom

Activities, Progress, and Results

Artificial Insemination Educational Workshops: Taking Beef Genetics Into Your Own Hands

Michael DuPonte

Ranchers learn about artificial insemination at a workshop conducted by CTAHR extension agents.

Breeding cattle for improved beef production in Hawai‘i’s conditions has been a challenge for local cattle producers for the past two decades. Although breeding stock can be imported from the U.S. mainland and other countries, the expense to purchase and transport them, as well as the state’s import permitting process, make it unfeasible for most ranchers. The use of artificial insemination (AI) in livestock is not a new technology; it has been practiced since the early 1950s by dairy and beef producers and is the fastest, simplest, and most economical method to improve livestock genetics. In the late 1970s, Hawai‘i led the western coast of United States in the use of AI in beef cattle due to the number of registered (purebred) herds, or seed-stock producers, in the state and the strong local market paying a premium for “choice” quality beef.

Since then, the demographics of livestock industry in Hawai‘i have changed, for many reasons. Today, the state has fewer seed-stock producers, the local feedlot has closed, and the majority of beef producers are cow-calf operations supplying live calves to lucrative export markets in North America. The industry’s objective shifted from producing better calves to volume breeding because the producers were no longer receiving a premium for quality grades. Moreover, there was a shortage of AI technicians with the loss of seed-stock producers, so beef ranchers were relying solely on herd bull breeding. After two decades, fuel, transportation, and feed costs are reaching record highs, dramatically reducing the profit margin of the export strategy. This will force Hawai‘i beef producers to market more cattle at home through local niche markets. Once again, improving calf performance through breeding has become pivotal in developing a successful grass-fed market.

A recent survey of Hawaiian Home Lands ranchers showed that AI was not being used in their management because (1) training was not available, (2) a lack of trained technicians for hire, (3) commercial semen companies were not interested in serving small orders, (4) AI equipment is not available locally, and (5) maintaining a liquid nitrogen tank on site was too expensive. Through support from the Department of Hawaiian Home Lands, a pilot project was implemented to teach an AI school for ten cattle producers in conjunction with the Honokaia Ranch Expansion Project in Waimea. The educational goals of the project were to help small ranchers (1) improve their genetic base through AI, (2) implement recordkeeping programs to measure progress, (3) use synchronization and heat detection methods during AI, (4) track carcass quality through ultrasound technology, and (5) improve the genetic pool available

locally. The first series of AI workshops was held October 22–26, 2007, and evaluated by DHHL, which deemed them to be of value to their homesteaders. So far the project has expanded to three workshops and graduated 27 new AI technicians. A fourth class was taught in March 2008 to peak enrollment, so more classes will likely be scheduled. With the influx of AI technicians available, it is our hope that AI will again allow beef producers to take their herd's genetics into their own hands.

Genetics and DNA Technology

Jinzeng Yang, Robert Ferreira, Mike DuPonte, Glen Fukumoto

Objectives

Cattle breeds are the genetic foundation for beef industry, which significantly influences the profit of cattle production operations. An organized genetic program for seedstock cattle breeders in Hawai'i is necessary for the benefit of the entire Hawai'i beef cattle industry. Angus Plus cattle are Brahman/Brangus derivatives that have been derived from purebred lines between 65 and 96 percent Angus or Brangus and a minimum of 4 percent Brahman. By introduction of Brangus and Brahman genetics to Angus, Angus Plus cattle offer great advantages for rough, humid, and forage environment and superior carcass quality over Angus. The primary objective this project for the past year was to evaluate the suitability of Angus Plus cattle for Hawai'i climates and to study the polymorphisms of bovine growth hormone receptors as DNA markers for growth performance in pasture-based cattle populations.

Research Progress and Accomplishments

The highlights of the accomplishments include (1) cattle sample collections and DNA isolations, (2) calf growth performance data analysis, (3) analysis of growth hormone receptor polymorphisms in relation to calf growth performance, and (4) carcass quality evaluation by ultrasound technology. Research data were presented to the Joint Annual Meeting of American Society of Animal Science in 2007.

Data of pre-weaning growth traits were collected from 213 Angus Plus calves born from 2003 to 2006. Least-square mean of pre-weaning ADG ranged from 1087 to 1167 g/d in bull calves and from 1030 to 1048 g/d in heifer calves. The least square mean of 205 d-adjusted weaning weight was 226 to 285 kg in bulls and 214 to 252 kg in heifers. The birth weight and hip height at birth were highly significantly correlated with weaning weight, 205 d-adjusted weaning weight, hip height at weaning, and pre-weaning ADG ($P<0.01$). Statistical analysis by MIXED model with fixed effects of sire group, sex of calf, and year indicates that sire group significantly influenced pre-weaning growth performance through interaction with sex of calf. The sire group by calf sex interaction was important ($P<0.05$) for calf birth weight, 205-d adjusted weaning weight, and pre-weaning ADG. Sire group also played a significant role in hip height at birth ($P<0.05$) but did not significantly ($P>0.05$) influence hip height at weaning. These results demonstrated great performances of Angus Plus calves raised on 100% pasture in Hawai'i climates. Selections of sires preferable for growth can significantly improve calf pre-weaning growth performance.

A polymorphic microsatellite (TG)n from the growth hormone receptor (GHR) promoter region, located 90 base pairs upstream of the GHR gene, has been associated with growth performance in beef cattle. The 16-20 TG-repeat, named long allele (L), are mostly presented in Bos taurus breeds, while the 11 TG short allele (S) is common in Bos indicus cattle. Angus Plus cattle are bred by maintaining a minimum of 4 percent Brahman in the Angus or Brangus breed. We genotyped the GHR microsatellites by PCR amplification and DNA fragment analysis, and we compared growth performance between

different genotypes of the GHR microsatellite. The frequency of long and short alleles in the herd was 80.2 percent and 19.8 percent (N = 96), respectively. Calves with LL, SS, and SL genotype had BWT of 35.52 ± 0.97, 34.21 ± 0.91, 31.02 ± 2.00 kg, respectively; the mean of analyzed growth traits of the SL genotype is between the SS and LL genotypes. Based on a limited number of the animals, the results demonstrate a moderate frequency of short GHR allele in the current Angus Plus herd. The application of this GHR microsatellite genotyping to selection of growth traits needs to be further validated with a larger number of animals.

Acknowledgements

Special thanks to Olumau Angus Plus, LLC and the CTAHR Mealani Experimental Station for recoding growth data and blood sample collections. Mark Thorne, Milton Yamasaki, Marla Fergerstrom, Lincoln Ching, Baoping Zhao, and Jin K. Lee provided assistance to the project.

Meat Science and Technology

Investigators: Yong Soo Kim, Glen Fukumoto, Michael DuPonte

Area of Research

Nutritional and Eating Quality of Locally Produced Forage-Finished Beef

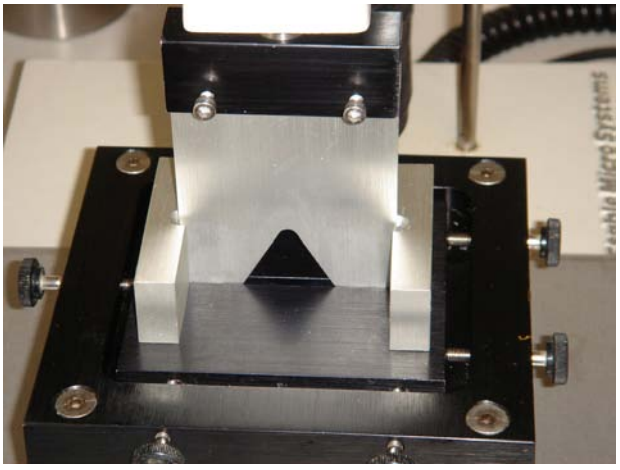
Objectives

- To examine the tenderness of forage-finished beef produced in Hawai‘i
- To investigate the intrinsic and extrinsic factors affecting the tenderness of forage-finished beef produced in Hawai‘i
- To measure CLA content and polyunsaturated fatty acid composition in forage-finished beef produced in Hawai‘i

Activities, Progress, and Results

Hawai‘i Grass-Finished Beef Tenderness Study

Yong S. Kim, Michael W. DuPonte, Glen Fukumoto



What is this important tool? Tenderness is the key to beef-eating satisfaction; the shear force instrument outfitted with a Warner-Bratzler blade, above, is used to measure beef tenderness.

This study was designed to evaluate the current status of meat tenderness of forage-finished cattle produced in Hawai‘i and to determine what production factors affect the meat tenderness of forage-finished cattle. Two rib eye steak samples from the 12th rib were obtained from 191 forage-finished cattle harvested at two local slaughterhouses on Hawai‘i. The steak samples were individually vacuum-packaged in Kapak pouches, aged for 2 weeks at 4°C, then stored at –20°C for later proximate analysis and measurement of shear force values of cooked steaks. The vacuum-packaged steak samples were thawed and cooked in a water bath at 70°C for 1 hour, cooled to room temperature, and shear force values were measured from 1.3-cm core samples (six per steak). Information on animal age, breed, carcass weight, and sex was obtained during sample collection from the slaughterhouses. Carcass weight ranged from 353 to 939 lb with a mean value of 601.8 lb. Intramuscular fat content ranged from 0.19 to 14.11 percent with a mean value of 4.49. Shear force value ranged from 2.41 to 9.41 kg with a mean value of 5.21. The shear force value of heifers (5.52 ± 0.133 kg) was higher ($P<0.05$) than that of steers (4.96 ± 0.148 kg). The shear force value of the age group 24–36 months (4.97 ± 0.137 kg) was lower ($P<0.05$) than that of the age group over 36 months (5.51 ± 0.149 kg) or the age group below 24 months (5.23 ± 0.321 kg). The shear force value of Hereford breed (n = 19, 6.24 ± 0.288 kg) was higher ($P<0.05$) than that of Angus (n = 53, 5.19 ± 0.172 kg), Bos taurus crosses (n = 76, 5.06 ± 0.144 kg), or other breeds (n = 25, 4.91 ± 0.251 kg). The correlation coefficient of shear force value with

intramuscular fat was 0.025, indicating that the intramuscular fat is not a good indicator for meat tenderness of forage-finished beef produced in Hawai‘i. In conclusion, the results of this study indicated that meat tenderness of forage-finished cattle can be improved by younger age at harvest and possibly by proper selection of breed types. This research resulted in a CTAHR publication that can be found at http://www.ctahr.hawaii.edu/oc/freepubs/pdf/FST-27.pdf.

Comparison of Carcass Quality and Meat Tenderness Between Pasture- and Feedlot-Finished Beef

Yong Soo Kim, Glen Fukumoto

This study compared the carcass quality and meat tenderness between Hawai‘i pasture-finished beef and Idaho feedlot-finished beef originating from similar herd genetics from Hawai‘i. Two rib eye steak samples from the 12th rib were obtained from 30 feedlot-finished cattle harvested at a slaughterhouse in Pasco, Washington, and shipped to a CTAHR laboratory in December 2007. The cattle composed of Angus-sired crossbreed calves were from the Mealani Research Station and were shipped to California after weaning for growing and finishing in an Idaho feedlot for 3 months before slaughter. Samples of pasture-finished beef were obtained from 13 cattle that were raised at the Mealani Research Station and harvested at a local slaughterhouse on Hawai‘i in November 2007. Samples were from the same location of the carcasses as that of feedlot-finished cattle. Meat tenderness was measured as described in the previous study. The shear force value of pasture-finished ranged from 7.5 to 3.6 kg with a mean of 5.18. The shear force value of feedlot-finished beef ranged from 7.6 to 2.4 kg with a mean of 4.40, indicating that finishing cattle in a feedlot tends to produce more tender beef compared to finishing cattle on pasture only. While the mean shear force value of the pasture-finished beef was slightly higher than that of feedlot-finished beef, the distribution of shear force value of pasture-finished beef suggests that cattle can be finished in Hawai‘i pasture with quality high enough to satisfy consumers’ beef-eating experience. Studies are ongoing to examine potential factors contributing to the difference in meat tenderness between the pasture-finished and feedlot-finished beef.

Outreach

Investigators: Mark Thorne, Glen Fukumoto

Activities, Progress, and Results

Hawai‘i Grazing and Livestock Management Academy

Mark Thorne

The purpose of the Hawai‘i Grazing and Livestock Management Academy is to provide an education program for livestock producers, state and federal land-management personnel, and University of Hawai‘i faculty and extension personnel focused on sustainable grazing and livestock management practices. The specific goals of this educational program are to (1) improve the grazing and livestock management practices of producers in the state of Hawai‘i, (2) increase the number of producers using sustainable grazing and livestock management practices in the state of Hawai‘i, and (3) increase the number of acres in sustainable livestock production.

This program offers 20 hours of instruction in sustainable grazing and livestock management practices to course participants. The course is taught in a series of sequential modules beginning with a comprehensive introductory course, Range and Pasture Management 101. Individuals attending the introductory course will be eligible to participate in subsequent courses that will focus on specific topics including plant-animal interactions, grazing animal behavior, ranch economics, and ranch management planning.

This project was initially funded through the USDA-Natural Resources Conservation Service for 3 years ($53,152) ending September 30, 2007. During 2007, courses were taught to 66 participants on Hawai‘i, Maui, and Kaua‘i. Two years of additional funding ($30,000) through USDA-RREA has been granted to continue this educational outreach program.

2007 Mealani Forage Field Day Educational Program

Mark Thorne

The Mealani Forage Field Day has been annual educational outreach program to provide information on forage-based livestock production to Hawai‘i’s livestock industry. The program has three primary goals that focus on creating a livestock industry in the state that is ecologically, economically, and socially sustainable: (1) to provide technology and information on development of sustainable forage production systems to Hawai‘i’s livestock industry (ecological sustainability), (2) to provide information on opportunities and incentives for market development of forage based livestock products (economic sustainability), and (3) to provide information to producers, processors, retailers, and the consumer about the benefits of forage-based animal production systems—healthy foods, healthy economy, healthy environment (socially sustainable).

The success of this program is evident in that USDA-NRCS has continually provided funding (a total of $46,631 over past four years). 420 individuals have participated in the program, and in-kind contributions from sponsors increased from just over $250 the first year to $2,200 in 2007. Each year of the program, the committee sought to bring in individuals who are at the cutting edge of their fields. These individuals included Kit Pharo, a seed-stock producer from Colorado; Dr. John Arthington, a beef production specialist and researcher at the University of Florida; Steve Keville, a meat marketing analyst with Whole Foods Inc.; John Hewlett, the farm and ranch management specialist at the University of Wyo-

Outdoor classrooms are commonplace in our extension outreach programs.

ming; and Jeff Tranel, an agricultural economics specialist at Colorado State University. The information disseminated by this array of speakers over the past four years has contributed greatly to the knowledge base of the livestock producers who attended the program. In order to extend the impact of this great program, CTAHR's Linda Cox and Mark Thorne have co-edited proceedings for the field day for the past three years. These proceedings are provided to the participants at the field day event and also made available to other interested parties online, direct mailings, and at other workshops. Program evaluations provided at each of the last four field day programs indicated that most participants have enjoyed the programs, learned something about each topic, and in many cases would implement some practice or use a new technology that was presented.

National Animal Identification System Educational Program

Mark Thorne

Following the successful year of educational outreach on the National Animal Identification System, the Hawai'i Department of Agriculture requested and funded ($49,000) an additional year of educational programs. The focus of the educational program for 2007 was to provide printed material to livestock producers including educational brochures, newsletters, and technical support information for registration and animal identification equipment. Workshops will be held to assist producers in premise registration and animal identification needs.

Celebrating A Taste of the Hawaiian Range Festival and College Centennial

Glen Fukumoto

The annual foodie pilgrimage descended upon the 12th Annual Mealani's A Taste of the Hawaiian Range held at Hilton Waikoloa Village on the Kohala coast. The event was coordinated by CTAHR's Cooperative Extension Service and Mealani Research Station, and it was the fifth year that it has been held in Kohala. A capacity crowd of nearly 2000 people participated in the food festival, which raises consumer awareness of Hawaii's forage-fed meats and island-fresh produce. Thirty-three chefs lent their skills to the event, tackling unusual cuts of meat, while 34 food vendors and displays highlighted Hawai'i products. In addition, a birthday cake was presented in honor of CTAHR's 100-year anniversary of serving the citizens of Hawai'i.

The event drew media from some of the mainland's largest media markets—Los Angeles, San Francisco, New York, and Philadelphia—as well as from Australia. Although most of the guests live on

Hawai‘i, one in five was a visitor who came from the neighbor islands, the mainland, or foreign countries. Over the course of the festival's past five years, since survey tracking was implemented, visitors from 43 U.S. states and seven foreign countries (Palau, Australia, Guam, Japan, England, Canada, and New Zealand) made their way to CTAHR's largest outreach event.

One of many participating chefs in Hawaii's most unique and best-valued food event.

Participating ranchers in the second Kohala Mountain Oyster Rancher Cook-off went above and beyond to impress the esteemed panel of judges with their traditional ranch delicacy. Ranchers included reigning champion Jeri Moniz of K.K. Ranch and new competitors Pono von Holt of Ponoholo Ranch and Dr. Tim Richards of Kahua Ranch, Ltd. The anxious panel of judges included Mr. John Heckathorn, editor, Hawaii Magazine, Executive Corporate Chef Jackie Lau, Roy's Restaurants, and Dr. Andy Hashimoto, CTAHR dean. And the winner…the Kahua Ranch rendition of pan-sheared "oysters" over the white heat of a branding stove impressed the judges' taste palate.

For the fifth year, the Taste honored the farmers and ranchers who toil on our lands producing quality foods for Hawai‘i consumers. The 2007 Outstanding Rancher Award went to Clarence Rapoza of Palani Ranch Co., Inc. and the 2007 Outstanding Farmer Award was presented to Raymond Kawamata of Kawamata Farms. Kawamata has been a farmer since the early 1960s, growing a wide variety of vegetables and later, Kamuela roses. Now under greenhouses in the Lalamilo area of Waimea, Kawamata produces vine-ripened tomatoes under the Kamuela Tomatoes brand. He is known for his generous donations of produce to various organizations in the community. Rapoza has been in the beef business all his life and is known for his cooperative efforts in fulfilling cattle needs and providing transportation for other ranchers. He is also known for his community involvement and was instrumental in the design and building of the Portuguese-style stone oven for the Kona Historical Society. Thanks to the both of these outstanding gentlemen for their contributions to Hawai‘i agriculture.

Mahalo to the major sponsors of the event: the County of Hawai‘i's Department of Research and Development, the Hawai‘i Tourism Authority, the Hilton Waikoloa Village Resort, Kulana Foods Ltd., Big Island Farm Bureau, and Kamuela Grown. Mahalo also to the 2007 planning committee community members Joan Namkoong (community supporter), Lorie Farrell (Big Island Farm Bureau), Tom Asano (Kulana Foods, Ltd.); the Hilton Waikoloa Village Resort team including Willy Pirngruber, Michael Blaksteen, Len Hiraoka, Fred Lau, Chef Kenneth Omiya, Kelly Alatan, Kristine Coppin, Leanne Pletcher and Meredith Wertz; and the dedicated CTAHR faculty and staff, including Milton Yamasaki, Sarah Hashimoto, Randy Hamasaki, Mark Thorne, Kathy Onuma, Percy Roque, Marla Fergerstrom, Roy Ishizu, Lori and Les Hasegawa, Sonny Arruda, Kelly Asai, and Earl Arakaki. We also thank the many volunteers who helped the event run smoothly.

Mealani Research Station

Historic Partnership with one of Hawaii's Ranching Industry Leaders

Glen Fukumoto

In an unprecedented offer by a leader of the Hawaii Beef Cattle Industry, the market calves from the Mealani Research Station were marketed through a unique multi-state partnership between CTAHR University of Hawaii at Manoa, Kahua Ranch, Ltd and California Polytechnic Institute University at San Luis Obispo. As part of the marketing plan of the station, this market venture will tremendously contribute to the genetic progress of the Mealani herd by providing critical stocker and feedlot performance data and feedlot carcass data. Under the past marketing plans, the calves were sold to the open market. No follow-up growth performance records were kept and evaluated for impact on the genetic progress of the herd. More importantly, no carcass information was collected and documented for the herd in the past decade. This partnership opportunity will offer valuable information toward the improvement of the research herd and for the broader benefit of the beef industry. When ask why he was doing this, Dr. H.M. 'Tim' Richards, General Manager of Kahua Ranch, Ltd. said that it was the right thing to do, "the partnership will help the University to understand, from a management and economic perspective, what much of the local cattle industry is facing (in marketing beef cattle), and also to assist in the evaluation of UH genetics in relationship to the national (beef cattle) industry."

Many positive changes have taken place at the University of Hawaii's one and only beef research station. Plan a visit to the Mealani Research Station in Waimea on the Big Island.

In addition, this market outlet will provide a multi-state research and outreach partner with Cal Poly-San Luis Obispo, adding to the growing number of beef industry partnerships within the State of Hawaii. Dr. Jonathan Beckett, Department of Animal Sciences in the College of Agriculture, Food and Environmental Sciences, specializing in beef cattle production and oversees the livestock enterprises at Cal Poly's Swanton Pacific Ranch (http://www.spranch.org/). Continued collaboration, initiated by this partnership will help to forging future research efforts between Cal Poly and CTAHR.

With the production and economic data gained from this study, the information can be openly shared with the Hawaii beef cattle industry and will provide key genetic progress information on the UH herd.

The genetic improvement will lead to better trait carcass selection and ultimately impact the Hawaii beef cattle industry through the offering valuable and proven genetic breeding stock.

Getting High on Genetic Because Our Bulls are on Grass

Michael DuPonte

The role of value-based marketing in the beef industry is of utmost importance to the local cattleman. Today more than ever, carcass traits will receive increased emphasis when management decisions for breeding cattle are being made. There is some debate within the beef cattle industry on whether too much emphasis is being placed on the end product (carcass quality) and not enough on reproductive efficiency, early growth and cost of production, which have the greatest impact in profitability on cow calf operations. As the industry moves to true value-based marketing and more cattle are sold on individual merit rather than the average of a group, carcass quality traits will likely increase in economic importance. Over the years a huge void in local seed stock operations and replacement animals within the state has developed due to lucrative calf export marketing programs and retirement of local cattle breeders.

During the last four years, UH Mealani Research Station has been catering to meeting industry needs with the gradual transition from traditional ranching activities of a composite cow calf herd being shipped to the mainland to providing industry with the genetics of purebred breeding stock that produced high quality grass finished characteristics. The conversion has not been smooth but with the incorporation of scientific based management tools, such as computerized record-keeping, artificial insemination using carcass EPD's, estrus synchronization during the breeding season, ultrasound technology at weaning, DNA gene mapping and sequencing of offspring along with intensive pasture supplemental grazing the program is starting to reap dividends. The sale of Mealani heifers averaged $318/head shipped to the mainland prior 2002 as compared to the high of $462.50/head as replacement heifers kept home in 2006 Range ready bulls prior to 2002 averaged below slaughter value of $600 versus comparable bulls in 2006 averaging $1400 with a high of $2300. Currently our steer grow out program is marketing grass-finished steers (1200 pounds) at 17 to 18 month of age with choice quality criteria. Mealani will continue to provide this livestock service to the industry through research trials, animal sales and outreach activities expanding our endeavors into the development of grass finishing genetics.

Grassfed Beef Production

Glen Fukumoto

Over the past two calving seasons, the Mealani Research Station has initiated a demonstration project to evaluate the production of high quality grassfed beef in Hawaii. The goal of the study is to determine optimum production factors required to produce a quality grassfed market animal in 24 months or less. Over the past two seasons, spring born steer calves (n = 27) were selected after weaning and assigned as the lead group in stratified grazing system, where the strata was comprised of three herds, the steer, replacement heifer and cow herd. One grazing cycle was approximately 45 days. The steers were raised up to target market weights, under the current herd protocol at the research station. All calves were Angus sired from Angus and Angus x Composite cows.

	Birth	Wean	Final	ADG from Birth	Weight per Day of Age
Liveweight, pounds	90.1	549.7	1242.7	1.90	2.05
Age, days	0	217.8	604.7	-	-

Hot Carcass Weight, lbs.	Dressing Percentage	Rib Eye Area, in^2	Backfat, in.	Marbling Score	Shear Force, kg	Gross Revenue per head
669.7	53.9	12.0	0.29	Small 50 Low Choice	5.2	$837.13

Under the current stratified grazing system at the research station, the steers received the best available forage resulting in excellent growth throughout the entire grazing period. The average harvest age was 20.1 months and average daily gains were 1.90 and 1.79 from birth and weaning, respectively. Results of the carcass and tenderness qualities of the beef produced were very good. Base on marbling scores alone, USDA carcass grade equivalents resulted in 7 Select, 19 Choice and 1 Prime grade carcasses. The demonstration project suggests that pasture based production and finishing of cattle in Hawaii can produce high quality beef.

Special Features

CTAHR Celebrates Its 100th Birthday

Glen Fukumoto

As the founding college of the University of Hawai‘i, in 1907, the College of Tropical Agriculture and Human Resources, as it is known today, has touched the lives of many thousands of Hawai‘i’s citizens. From the 4-H beef steer project, to research and development of Hawaiian Supersweet corn, to the beautiful orchids and anthuriums giving color to our lives, CTAHR’s impact and outreach is broad-based and a significant part of agriculture and communities in Hawai‘i and the Pacific. Beef research and extension programs at the college have brought many advances in grazing management, nutrition, breeding and genetic improvement, and disease management and have served the ranching community for most of our celebrated 100 years.

Dean Andrew Hashimoto celebrating CTAHR’s Centennial at Mealani’s A Taste of the Hawaiian Range Festival.

Lincoln Ching Retires after Serving Hawai‘i’s Livestock Agriculture for More Than Three Decades

Glen Fukumoto

Clockwise from left – Hard at work installing pasture research plots on Kaua‘i; wrangling art deco sheep in New Zealand; visiting with Dr. Mohammad Koohmaraie at the USDA Meat Animal Research Center; presenting industry updates at the Mealani Forage Field Day; Lincoln’s favorite passion: killing weeds on the ranch.

Hawai‘i’s Organic-Certified Beef Ranches

Glen Fukumoto

Organic foods, although representing only a small portion of the food supply in the United States, have seen a huge growth increase within the past few years as evidenced by the presence of a multitude of products in the marketplace. Similarly, the expansion of organic beef operations will continue the double-digit growth projections of the organic market. Organic beef supply lags behind other organic food products simply because of the production logistics: it takes time, anywhere from 20 to 24 months, to raise the beef animal from calf to finished product.

Hawai‘i’s first certified-organic beef operation, Beef and Blooms, is a family affair. Pictured from left to right: Anne Marie, Katie, Daniel, and William Jacintho.

According to the Hawaii Organic Farmers Association’s first Hawaii Organic Products Directory released in 2008, there are three beef cattle ranches and one beef processor certified under the HOFA certification process. All these operations do business in Maui County. They include Beef and Blooms, Pu’u O Hoku Ranch, Triple L Ranch, and the Molokai Livestock Cooperative. Pioneering the organic livestock certification movement in Hawai‘i was the Jacintho ‘ohana of Maui, when in 2006 William and Anne Marie Jacintho had their diversified family farm operations of beef cattle and nursery products, called Beef and Blooms, recognized as the first certified-organic beef operation in Hawai‘i. In a discussion with Mr. Jacintho, I asked him to share his mana‘o about the process, benefits, and challenges of organic certification.

Give a brief introduction about your operation.

Currently, we have Angus, Brangus, and Wagyu breed cattle on the ranch [William is the fourth generation to perpetuate traditional ranching and family values on the family lands]. In addition to cattle, we grow landscape plants in a nursery operation, primarily bedding plants, caladiums, hanging baskets, color bowls, and other assorted landscape plants for color.

Why did you decide to get your ranch operation certified organic?

About five years ago, I met Alfred Wylie, who is the USDA Organic Beef Inspector for the state. He talked a lot about organic beef and kept encouraging us to go through the certification process. I pondered this idea for about two years. I looked at the application, and my oh my, there was a lot of paperwork and recordkeeping in the process, and absolutely no chemicals allowed on the pastures, or on the livestock. More and more the word “organic” kept popping up, as well as the demand for organic farm products.

What are the direct benefits to you?

With the way the price of conventional beef is, there is no hope for getting ahead. As we researched the markets, we found that with an organic operation, beef sells for a lot more per pound. As a result, we

decided that since we have been producing beef for generations in an organic way, we should go the next step and try out the niche market.

What is the certification process like?

We joined HOFA, and they were very supportive in the certification process. We got our paperwork completed, and in a few months, after HOFA reviewed everything, the inspector came out and inspected and certified our operation. I got to tell you, besides the days of filling out paperwork, the inspection was an all-day process, but we did become the first certified organic ranch in the state of Hawai‘i. The certification is good for one year, so every year an application is filled out and sent to HOFA for preliminary review. Then, an inspector is sent out and all pasture and livestock records are inspected, all pastures in the program are inspected, and all the livestock in the program are inspected.

What are the challenges?

We have a USDA-approved label for ALL NATURAL BEEF that we use for a store showcase set-up. In addition, our ORGANIC label design is ready for USDA approval, once the slaughterhouse receives their paper work back from the HOFA approving process, and an inspector is assigned to certify them. We are also in full compliance with UPC global data synchronization with Global Exchange, and 1SYNC Item Management. All of these are hurdles of the business, which take lots of dedicated time to obtain—and business expense.

Who are your customers?

At this time, our product is sold to families with a freezer that buy a quarter beef, or a half, or even a whole chilled beef, that is custom-cut by the processing plant and ready for cooking.

What is the future of organic beef production in Hawaii?

We see the future of organic beef as a positive one, but it is very new to the Islands, and needs to be marketed in a way that all of the beef cuts can be utilized by the purchaser. So, be it a high-end restaurant, a store, or a family with a freezer, marketing and education is the bottom line.

On the Hawaiian Range—A Photograph Montage

Clockwise from top left: feisty 'ol longhorn, keeping it hot, one of the cowboy's best friends, lost in the fog, starting to dry up, the old mountain bunkhouse.

Youth Connections

John Powley

The County 4-H Livestock Associations are a major part of the State 4-H Livestock Association. The 4-H programs emphasize education through hands-on learning in livestock projects, starting from ages 7 to 9 in the Clover Buds through age 19 for the senior 4-H members.

4-H philosophy stresses "learn by doing"; juniors learn directly from their senior member in the various livestock market classes.

The beef cattle projects are always large, and a special emphasis is placed on the grand champion beef steer. The CES livestock extension agents work with the 4-H agents as subject-matter resources and advisors to the associations. There are about 50 4-H'ers from 33 families in the associations, and there are several events showing and selling their projects. In addition, the 4-H'ers are required to keep records, participate in livestock judging, and attend industry quality assurance classes and financial management workshops.

Early introduction and a positive experience for up to 20 years with livestock and the support from industry leaders has, in several instances, influenced 4-H'ers in their decision to enter the university majoring in animal science and going on to animal science graduate school programs and veterinary schools.

Community support from purchasers of projects, suppliers of animals, local ranches, and veterinarians reflects a desire to assist youth development and lays the groundwork for our youth to choose to enter livestock industries.

Scholarly Achievements

Cumulative, 2004 to 2008

Summary of Publications and Presentations

7 National abstracts, 1 international abstract
3 Journal articles
21 CTAHR publications*
21 Field day articles
25 National and statewide presentations

**Note: CTAHR publications can be found at www.ctahr.hawaii.edu/freepubs.*

Economics and Marketing

Publications, Proceedings, and Other Reports

CTAHR (College of Tropical Agriculture and Human Resources, University of Hawai‘i at Mānoa)

Cox, L.J. 2006. Evaluating market options with a ranch production cost analysis. Proceedings, 2006 Mealani Forage Field Day. p. 5–7.

Cox, L.J., Q.A. Edwards, M.S. Thorne, G.K. Fukumoto, and L.Y.T. Ching. 2006. Commercial cow-calf management decisions: Calculating your cost of productions with CALF-XL 2006. CTAHR Livestock Management no. 12. 23 p.

Franco, A., and L.J. Cox. 2006. The markets for Hawaii beef: Challenges and opportunities. Proceedings, 2006 Mealani Forage Field Day. p. 16–17.

Cox, L.J., Q.A. Edwards, M. Thorne, and G. Fukumoto. 2005. Calculating the cost of production for a cow-calf operation. CTAHR Livestock Management no. 11. 15 p.

Cox, L.J. 2005. Cost of production and marketing options. Proceedings, 2005 Mealani Forage Field Day. p. 31.

Oral and Poster Presentations, Seminars, Workshops, Facilitations

Cox, L.J. 2005. Cost of production and marketing options. Proceedings, 2005 Mealani Forage Field Day. p. 31.

Cox, L.J. Evaluating market options with a ranch production cost analysis. A half-hour presentation at the 2006 Mealani Forage Field Day.

Cox, L.J. Calf-XL. A one-hour workshop at the 2005 Mealani Forage Field Day.

Cox, L.J. Cost of production and marketing options. A half-hour presentation at the 2005 Mealani Forage Field Day.

Cox, L.J. Calculating your cost of production. A one-hour presentation at the Cowboy College Sponsored by the Hawaii Cattlemen’s Council, November 19, 2004, Kailua-Kona.

Value-Added Technologies

Publications, Proceedings, and Other Reports

National

Jun, S., Y.S. Kim, L.J. Cox, and A. Huang. 2007. Potentials of retort pouches for adding value to less desirable cuts of beef. FoodSmarts: Institute of Food Technologists Annual Meeting and Food Expo, Chicago. Abstract #096-42.

CTAHR

Jun, S., L.J. Cox, and A. Huang. 2006. Using the flexible retort pouch to add value to agricultural products. CTAHR Food Safety and Technology no. 18. 6 p.

Manuscript in Preparation

Jun, S., Y.S. Kim, L.J. Cox, and A. Huang. 2008. Potentials of retort pouches for adding value to less desirable cuts of beef. Journal of Food Process Engineering.

Oral and Poster Presentations, Seminars, Workshops, Facilitations

Jun, S., L.J. Cox, and A. Huang. 2006. Using the flexible retort pouch to add value to agricultural products. Proceedings, 2006 Mealani Forage Field Day.

Pastoral System

Publications, Proceedings, and Other Reports

National

Thorne, M.S., J.L. Deenik, H.H. Keyser, L.J. Cox, and M.H. Stevenson. 2008. Remediation of former sugarcane lands for sustainable forage production. 2008 Joint Meeting of the Society for Range Management and the American Forage and Grassland Council, Louisville, Kentucky.

Thorne, M.S., D.R. Gardner, J.S. Powley, G.K. Fukumoto, and M.H. Stevenson. 2008. Fireweed (Senecio madagascariensis Poiret) control: An adaptive management approach. 2008 Joint Meeting of the Society for Range Management and the American Forage and Grassland Council, Louisville, Kentucky.

Buck, K., J.R. Carpenter, and M.S. Thorne. 2007. In situ rates of insoluble macro-mineral release from alfalfa and tropical grasses, and relationships with dry matter disappearance. Proceedings, Western Section, American Society of Animal Science 58:378–382.

Miyasaka, S.C., J.D. Hansen, and G.K. Fukumoto. 2007. Resistance to yellow sugarcane aphid: Screening kikuyu and other grasses. Crop Protection 26:4:503–510.

Miyasaka, S.C., J.D. Hansen, T.G. McDonald, and G.K. Fukumoto. 2007. Effects of nitrogen and potassium in kikuyu grass on feeding by yellow sugarcane aphid. Crop Protection 26:4:511–517.

Gardner, D.R., M.S. Thorne, R.J. Molyneux, J.A. Pfister, and A.A. Seawright. 2006. Pyrrolizidine alkaloids in Senecio madagascariensis from Australia and Hawaii and assessment of possible livestock poisoning. Biochemical Systematics and Ecology 34:736–744.

CTAHR

Deenik, J.L., M.S. Thorne, L.J. Cox, H.H. Keyser, and M.H. Stevenson. 2007. Best management practices for the remediation of former sugarcane lands for sustainable livestock production in Hawaii. Proceedings, 2007 Mealani Forage Field Day: Risk management for grass-based operations. p. 40–44.

Norman, A., M.S. Thorne, and M.H. Stevenson. 2007. Monitoring heifer development and diet quality of kikuyu–pangola grass using NIRS and NUTBAL PRO. Proceedings, 2007 Mealani Forage Field Day: Risk management for grass-based operations. p. 18–24.

Miyasaka, S.C., B.Matthews, P. Singleton, D. Greenough, and C. Clayton. 2007. Growth of two pasture legumes in an acid, aluminum-toxic soil. Proceedings, 2005 Mealani Forage Field Day. p. 36–39.

Thorne, M.S., G.K. Fukumoto, and M.H. Stevenson. 2007. Foraging behavior and grazing management planning. CTAHR Pasture and Range Management no. 2. 11 p.

Thorne, M.S., L.J. Cox, and M.H. Stevenson. 2007. Calculating minimum grazing lease rates for Hawaii. CTAHR Pasture and Range Management no. 3. 7 p.

Thorne, M.S., and M.H. Stevenson. 2007. Stocking rate: The most important tool in the toolbox. CTAHR Pasture and Range Management no. 4. 10 p.

Thorne, M.S., and L.J. Cox. 2007. Managing production risk for Hawaii ranchers. Proceedings, 2007 Mealani Forage Field Day: Risk management for grass-based operations. p. 11–17.

Thorne, M.S. 2006. Foraging behavior and grazing management planning. Proceedings, 2006 Mealani Forage Field Day: Hawaii Grown Beef: From Pasture to Market. p. 45–51.

Buck, K., J.R. Carpenter, and B.W. Matthews. 2006. Rate of dry matter and insoluble macromineral release of tropical pasture during in situ digestion trials in cattle. Proceedings, 2006 Mealani Forage Field Day. p. 18–27.

Carpenter, J.R., and B.W. Matthews. 2006. Effects of aeration and sewage biosolids on improved kikuyugrass pasture productivity and nutrient composition. Proceedings, 2006 Mealani Forage Field Day. p. 28-35.

Fukumoto, G.K., and M.S. Thorne. 2006. Evaluation of protein banking in a tropical pastoral system. Proceedings, 2006 Mealani Forage Field Day. p. 36–38.

Thorne, M.S. 2005. Integrated management for control of fireweed: An adaptive management approach. Proceedings, 2005 Mealani Forage Field Day. p. 23–30.

Thorne, M. S., J.S. Powley, and G.K. Fukumoto. 2005. Fireweed control: An adaptive management approach. CTAHR Pasture and Range Management no. 1. 8 p.

Humphreys, V.T., J.R. Carpenter, B.W. Matthews, and B.A. Buckley. 2005. The effects of temperature, rainfall, month of harvest and (or) pasture management on the mineral composition of kikuyu grass (Pennisetum clandestinum). Proceedings, 2005 Mealani Forage Field Day. p. 46–53.

Gusman, V.S., J.R. Carpenter, S.C. Miyasaka, and B.W. Matthews. 2005. Assessment of calcium, phosphorus, and oxalate intake and excretion by horses grazing kikuyu grass pastures in Hawaii. Proceedings, 2005 Mealani Forage Field Day. p. 54–60.

Sako, G., M. DuPonte, K.K. Lee, and K. Dinges. 2004. Senecio ragwort, a proactive study on Hawaiian Home Lands. 8th Mealani Forage Field Day

Oral and Poster Presentations, Seminars, Workshops, Facilitations

Thorne, M.S. 2007. Reducing the threat of wildfire through integrated management of fine-fuel loads. Waikoloa Town Meeting (May 4), Waikoloa, Hawai‘i.

Thorne, M.S., J.L. Deenik, L.J. Cox, H.H. Keyser, and M.H. Stevenson. 2007. Remediation of former sugarcane land for sustainable forage production. CTAHR Bioenergy Forum, June 28, 2007. Honolulu.

Thorne, M.S. 2007. Range and Pasture Management 101. Hawaii Grazing and Livestock Management Academy Workshop. Kamuela, (August 24–25), Pukalani (Aug 21–Sept 1), Līhu‘e (Sept. 7–8).

Thorne, M.S., J.S. Powley, and G.K. Fukumoto. 2005. Integrated management for control of fireweed: An adaptive management approach. Hawaii Cattlemen’s Council Meeting, May 14, 2005. Pu‘uwa‘awa‘a, Hawai‘i.

Genetics and Biotechnology

Publications, Proceedings, and Other Reports

National

Yang, J., J.K. Lee, R. Ferreira , M. DuPonte, and G. Fukumoto. 2007. TG-repeat microsatellites of growth hormone receptor and their associations with growth performances in Angus Plus calves raised on subtropical pasture. Journal of Animal Science 88 (suppl. 1): 253.

Yang, J., M. DuPonte, G. Fukumoto, and R. Ferreira. 2006. Growth performances of Angus Plus calves grazing on pasture in Hawaii subtropical climates. Journal of Animal Science 84 (suppl. 1): 421.

CTAHR

Sullivan, N., and J, Yang. 2007. Improving tropical cattle growth by DNA-based genetic analysis. Proceedings, 2007 Mealani Forage Field Day. p. 45.

LeaMaster, B., and M. DuPonte. 2007. Bull power: Examination of beef cattle bulls for breeding soundness. CTAHR Livestock Management no. 17. 3 p.

DuPonte, M., and K.K. Lee. 2007. Three simplified estrus synchronization programs for Hawaii's beef breeding season. CTAHR Livestock Management no. 14. 2 p.

DuPonte, M. 2007. The basics of heat (estrus) detection in cattle. CTAHR Livestock Management no. 15.

DuPonte, M. 2007. The use of proper semen handling during an artificial insemination program. CTAHR Livestock Management no. 16. 3 p.

DuPonte, M.W., and M.L. Fergerstrom. 2006. Application of ultrasound technology in beef cattle carcass research and management: Frequently asked questions. CTAHR Livestock Management no. 13. 3 p.

Yang. J., M. DuPonte, B. Zhao, G Fukumoto, and R. Ferreira. 2005. Development of DNA markers for genetic improvement of forage-based beef cattle in Hawaii. Proceedings, 2005 Mealani Forage Field Day. p. 37–38.

DuPonte, M., and K.K. Lee. 2004. Three simplified estrus synchronization programs for Hawaii’s beef breeding season. 8th Mealani Forage Field Day.

Yang, J., B. Zhao, M DuPonte, G. Fukumoto, and R. Ferreira. 2004. Genetic improvement of Hawaiian cattle through DNA technology. 8th Mealani Forage Field Day.

Meat Science and Technology

Publications, Proceedings, and Other Reports

International

Kim, Yong Soo. 2005. Carcass Characteristics of Forage-finished Cattle Grown in Hawaii. Proceeding International Joint Symposium: Current Trends and Issues in Animal Production. Jinju National University and University of Hawaii at Manoa, Honolulu, HI. p. 147-164.

National

Y.S. Kim, A. Ong, N. Bobbili, M. DuPonte, G.K. Fukumoto and C.N. Lee. 2007. Evaluation of meat tenderness of forage-finished cattle produced in Hawaii and factors affecting the tenderness. J. Anim. Sci. 85 (suppl. 1):492.

DuPonte, M., J. Dobbs, H.M. Zaleski and Y.S. Kim. 2005. Eating quality of forage-finished beef produced in Hawaii as compared to the imported mainland beef. J. Anim. Sci. 83[Suppl. 1]:159.

CTAHR

Kim, Y.S., A. Ong, N. Bobbili, M.W. DuPonte and G.K. Fukumoto. 2007. Evaluation of meat tenderness of forage-finish cattle produced in Hawaii and factors affecting the tenderness. CTAHR Food Safety and Technology no. 27. 7 p.

Fukumoto, G.K., and Y.S. Kim. 2007. Carcass characteristics of forage-finished cattle produced in Hawaii. CTAHR Food Safety and Technology no. 25, 7 p.

Kim, Y.S., C.N. Lee, M.W. DuPonte, and G.K. Fukumoto. 2007. Improving tenderness of forage-finished beef using a low-voltage electrical stimulator. CTAHR Food Safety and Technology no. 22. 6 p.

Fukumoto, G.K., and Y.S. Kim. 2007. Improving tenderness of forage-finished beef using a mechanical tenderizer. CTAHR Food Safety and Technology no. 23. 2 p.

Kim, Y.S., M. DuPonte, G. Fukumoto, and J. Yang. 2005. Improving meat quality of forage-finished cattle grown in Hawaii. Proceedings, 2005 Mealani Forage Field Day. p. 39–42.

Oral and Poster Presentations, Seminars, Workshops, Facilitations

International

Yong Soo Kim. 2006, “Meat quality characteristics of grain- and forage-finished beef”. Jinju, Korea, H-J-T (Hawaii, Jinju and Texas Tech University) International Joint Symposium on “Current and Future Directions in Animal Production and Research”.(Invited)

CTAHR

Y.S. Kim, A. Ong, N. Bobbili, M. DuPonte and G. Fukumoto. 2006. Carcass and meat quality characteristics of locally produced, forage-finished beef. Poster presented at the 2006 Mealani Forage Field Day.

Kim, Y.S., J. Dobbs, M. DuPonte, and H. Zaleski. 2004. Eating quality of locally produced beef as compared to mainland grain finished beef. 8th Mealani Forage Field Day.

Outreach

Publications, Proceedings and Other Reports

CTAHR

Thorne, M.S., and L.J. Cox (editors). 2007. Proceedings of the 2007 Mealani Forage Field Day; Risk Management for Grass-Based Operations. 43 p.

Thorne, M.S. 2007. National Animal Identification System: Phase 2, Animal identification. CTAHR Livestock Management brochure.

Yarlagadda, S., and C.N. Lee. 2007. Utilizing wheat millings for dairy calves and heifer feed. Proceedings, 2007 Mealani Forage Field Day. p. 6–10.

Thorne, M.S., and L.J. Cox (editors). 2006. Proceedings of the 2006 Mealani Forage Field Day; Hawaii Grown Beef: From Pasture to Market. 53 p.

Mattos, J.J., and M.S. Thorne. 2006. Slaughter and market issues at the Andrade slaughterhouse, Honokaa, Hawaii. Proceedings, 2006 Mealani Forage Field Day. p. 11–12.

Thorne, M.S. 2006. National Animal Identification System: Phase 1, Premises identification. CTAHR Livestock Management brochure.

Thorne, M.S., and L.J. Cox (editors). 2005. Proceedings of the 2005 Mealani Forage Field Day; Improved Livestock and Forage Production Through Sustainable Management Practices. 60 p.

Oral and Poster Presentations, Seminars, Workshops, Facilitations

National

Fukumoto, G.K. 2006. A Taste of the Hawaiian Range. Sustainable Agriculture Research and Education (SARE) National Conference; A Midwest Homecoming. Oconomowoc, Wisconsin. (Selected invitation in Direct Marketing Successes, Session II.)

Fukumoto, G.K. 2006. A Taste of the Hawaiian Range. The Successful Farming Radio Magazine, Producer/host Darrell Anderson, 08/24/06. www.agriculture.com

Statewide

Hawaii Beef Industry Strategic Planning Retreat. Honolulu, July 31–August 1, 2007. Facilitation.

CTAHR

Thorne, M.S. (coordinator) 2007. Managing Production Risk on Hawaii Ranches. RightRisk Workshop, John Hewlett, the Farm and Ranch Management Specialist at the University of Wyoming, and Jeff Tranel, an Agricultural Economics Specialist at Colorado State University. Kamuela (Jan. 12), Waikoloa (Sept. 28), L_hue (Oct. 1), Kula (Oct. 2).

Thorne, M.S. 2007. Sustainable Animal-Based Food Systems. Department of Human Nutrition, Food, and Animal Sciences, Invited Lecture, September 17, 2007. Honolulu.

DuPonte, M.W. (Principal Investigator). 2006. Beef ultrasound technology workshops, CTAHR Cooperative Extension Service, Maui Cattlemen's Association, Iowa State University, and Biotronics, Inc. Workshop locations: Waimea, March 15–16; Maui, June 10; Kaua'i, August 1; Moloka'i, August 30.

Thorne, M.S. (P.I.) 2006. Hawaii Program for the National Animal Identification System Workshops. CTAHR Cooperative Extension Service, Hawai'i Department of Agriculture, USDA Animal and Plant Health Inspection Service. Workshop locations: Hilo, June 19; Waimea, June 22; Maui, July 17; Moloka'i, July 18; Kaua'i, August 10; O'ahu, September 7.

Fukumoto, G.K. 2006. A Decade of A Taste of the Hawaiian Range Food Festival. Creating Success for Festivals and Events, Hawaii Tourism Authority and OmniTrak Group, Inc., May 2006. (Invited presentation, selected as one of four statewide festivals to make presentation about festival planning and operational success.)

Mattos, J., and M.S. Thorne. 2006. Slaughter and Market Issues at the Andrade Slaughterhouse. Proceedings, 2006 Mealani Forage Field Day. p. 11–12.

Ching, L. 2005. New Zealand Livestock and Forage Production Methods. Proceedings, 2005 Mealani Forage Field Day. p. 32–33.

Fukumoto, G., L. Ching, and L. Cox. 2005. New Zealand Study Tour Report. CTAHR Beef Initiative Program Report. 7 p.

Fukumoto, G.K. 2005. A decade of Mealani's A Taste of the Hawaiian Range, 1996–2005. Proceedings, 2005 Mealani Forage Field Day. p. 34–35.

Lee, C.N. 2005. Heat Stress in Cattle: Knowledge and Applications. Proceedings, 2005 Mealani Forage Field Day. p. 17–22.

Mealani Research Station

Publications, Proceedings and Other Reports

CTAHR

Fukumoto, G.K. 2006. Hawaii grass-finish production study; Prime beef on grass factsheet. Cooperative Extension Service handout.

Fukumoto, G.K. 2006. Protein banking production study; Adding value to your pastoral portfolio factsheet. Cooperative Extension Service handout.

Nishijima, W., M. Yamasaki, and T. Hata. 2005. Update on Mealani Research Station, 2005. Proceedings, 2005 Mealani Forage Field Day. p. 43–45.

DuPonte, M. 2005. The Mealani Genetic Improvement Program Using Performance Records on the Beef Herd. Proceedings, 2005 Mealani Forage Field Day, Cooperative Extension Service, College of Tropical Agriculture and Human Resources, University of Hawaii at Manoa, p 36.

Fukumoto, G.K. 2004. Pieces to the puzzle: Research components conducted at Mealani Research Station. 8th Mealani Forage Field Day.

Summary of Grants Received Above and Beyond Seed Grant

Number of grants funded: 24
Total dollars leveraged: $1,413,780
(Ratio to start-up funds: $4.36 to $1.00; Funds leveraged excludes in-kind contributions (time, labor, equipment, plot land area, etc.) by project cooperators.)

Grant Proposals Funded

Thorne, M.S., J. Deenik, R. Godfrey, G. Fukumoto, J. Powley, M. Duponte. 2008 Extension Outreach and Assistance in Improved Pasture and Livestock Management Practices for Pacific Islanders. USDA, $297,224.

Thorne, M.S., 2008. Hawaii Rangeland Management Education and Outreach Program. RREA. $30,000.

Fukumoto, G.K. 2007. Mealani's A Taste of the Hawaiian Range Agricultural Festival. County of Hawai'i, Department of Research and Development, and Hawai'i Tourism Authority, $25,000.

Thorne, M.S. 2007 Mealani Forage Field Day Educational Outreach, USDA NRCS, $14,209

Thorne, M.S. 2007–2010. Hawai'i Rainfall and Forage Production Index Project. USDA NRCS, $146,668.

Lee, C.N. 2007. Maximizing the use of local by-products feed to reduce cost, reduce environmental impact and enhance value of local industry: a dairy industry approach. Hawai'i Department of Agriculture and Hawaii Farm Bureau Federation, $22,985.

Thorne, Mark S. 2007-2008. CES Outreach and Education Program for the NAIS Implementation Project. USDA/HDOA. $49,000.

Thorne, Mark S. 2006-2008. Survey of the Natural Resources, fine-fuel loads, and extent of fountain grass invasion on rangelands in the PuuWaawaa area of west Hawaii. West Hawaii Wildfire Management Organization. $86,241.

Thorne, M.S., T. Miura, J.L. Deenik, and J. Powley. 2007-2008. Development of Best Management Practices for Control of Madagascar Fireweed (Senecio madagascariensis Poiret) in Maui County. Maui County R&D, $34,056.

Thorne, M.S., T. Miura, J.L. Deenik, and J. Powley. 2007-2008. Development of Best Management Practices for Control of Madagascar Fireweed (Senecio madagascariensis Poiret) in Hawaii. Hawaii Farm Bureau Federation, Research and Market Development Program, $80,313 (requested), $40,000 (funded).

Yang, Jinzeng. 2007. Genetic Selection of Beef Cattle by DNA and Ultrasound Technology. Hawaii Farm Bureau Federation. $70,000.

Thorne, Mark S. 2006. Mealani Forage Field Day Educational Outreach, USDA-NRCS/HGLCC, $13,122.

Fukumoto, Glen K. 2006. Mealani's A Taste of the Hawaiian Range Agricultural Festival. County of Hawaii, Department of Research and Development, and Hawaii Tourism Authority, $25,000.

Fukumoto, Glen K. 2006. Mealani's A Taste of the Hawaiian Range Agricultural Festival. County of Hawaii County Council, $10,000.

Thorne, Mark S. 2006. CES Outreach and Education Program for the NAIS Implementation Project. USDA/HDOA, $81,200.

Thorne, M. S. 2005. Mealani Forage Field Day Educational Outreach. USDA-NRCS, Grazing Lands Conservation Initiative Program, $8,800.

Fukumoto, G.K. 2005. A Taste of the Hawaiian Range Food Festival. County of Hawaii Department of Research and Development & Hawaii Tourism Authority. $33,500.

Thorne, M.S., L. Cox, J. Deenik and H Keyser. 2005. Best Management Practices for the Remediation of Former Sugarcane and Pineapple Lands for Sustainable Livestock Production in Hawaii. Submitted to USDA, CSREES Special Grant for Tropical and Subtropical Agriculture Research. Proposal request $262, 013.

Thorne, M.S., J. Carpenter. 2005. Hawaii Animal Performance and Forage Production Profiling Project. USDA-NRCS, $17,110.

Launchbaugh, K. (PI, University of Idaho), Thorne, M.S., E. Herring. 2004. UH Rangelands West Incentive Grant – Building Knowledge of Sustainable Rangeland Management Using Information Technology USDA-WSARE, $4,000.

Thorne, M. 2004. Mealani Forage Field Day Educational Outreach. USDA NRCS, Grazing Lands Conservation Initiative Program, $10,500.

Fukumoto, G.K. 2004. A Taste of the Hawaiian Range Food Festival. County of Hawaii Department of Research and Development & Hawaii Tourism Authority. $30,000.

Thorne, M.S. 2004. Hawaii Grazing and Livestock Management Academy. USDA-NRCS, $53,152.

Thorne, M.S. 2004. Best Management Practices for the sustainability of Hawaii's Range and Pasture Lands. USDA-CSREES Integrated Hatch-Smith Lever, $50,000.

Grant Proposals Pending

Kim, Y.S., et.al. 2008. Development of Blueberry-Added Ground Beef Products Using Locally-Produced Beef and Blueberry, July 1, 2008–June 30, 2009. Hawaii Farm Bureau Federation, $36, 965.

Thorne, M.S., T. Miura, J.L. Deenik, and J. Powley. 2007. Ecology, Toxicology, and Management of Madagascar Fireweed (Senecio madagascariensis Poiret) in Tropical and Sub-tropical Rangelands. USDA-National Research Initiative, $390,500.

Research Proposals Not Funded

Thorne, M.S., J. Arthington, C.N. Lee, and L.J. Cox. 2006. Forage and Calf Management Considerations for Optimizing the Economic Significance of Early Weaning in Tropical Environments – An Inter-Basin T-STAR Research Cooperation. Submitted to CTAHR for USDA-CSREES Tropical and Subtropical Agriculture Research Program funding. Proposal request: $215,381.

Team Members


Lincoln Ching


Dr. Linda J. Cox


Michael DuPonte


Glen Fukumoto


Dr. C.N. Lee


John Powley


Dr. Mark Thorne


Dr. Jinzeng Yang

Agents and Specialists

Glen K. Fukumoto, Livestock Programs, Human Nutrition, Food and Animal Sciences
Michael W. DuPonte, Livestock Programs, Human Nutrition, Food and Animal Sciences
Lincoln Y. T. Ching, Livestock Programs, Human Nutrition, Food and Animal Sciences (retired 12/2007)
John S. Powley, Livestock Programs, Human Nutrition, Food and Animal Sciences
Dr. Mark S. Thorne, Pasture and Range Management, Human Nutrition, Food and Animal Sciences
Dr. Linda J. Cox, Community Economic Development, Natural Resource and Environmental Management
Dr. C.N. Lee, Reproductive and Environmental Physiology, Human Nutrition, Food and Animal Sciences

Mealani Research Station

Milton T. Yamasaki, Station Manager (no photo)
Marla L. Fergerstrom, Beef Herdsman (no photo)

Researchers

Dr. Jinzeng Yang, Animal Biotechnology, Human Nutrition, Food and Animal Sciences
Dr. Yong S. Kim, Muscle Biology, Human Nutrition, Food and Animal Sciences (no photo)
Dr. Soojin Jun, Food Engineering, Human Nutrition, Food and Animal Sciences (no photo)

Other Contributors

Matthew H. Stevenson, Range Science Research Support (no photo)
Eileen Herring, Agricultural Librarian, UH Mānoa Library
Baoping Zhao, Research Associate, Human Nutrition, Food and Animal Sciences
John Gordines, Station Manager, Kauai Agriculture Research Station

Graduate Students
Quincy A. Edwards, Natural Resource and Environmental Management
Nicole Sullivan, Human Nutrition, Food and Animal Sciences
Kara Amber Lee, Human Nutrition, Food and Animal Sciences
Naveen Bobbili, Human Nutrition, Food and Animal Sciences
Kyung Ho Kim, Human Nutrition, Food and Animal Sciences
Allison Ong, Human Nutrition, Food and Animal Sciences

Post Doctoral Fellow
Dr. Heng Wang

Funded By
USDA, Cooperative States Research, Education and Extension Service Special Grant, entitled Hawaii Agricultural Diversification—New Crop/Product Development and Marketing. Funding cycles 2003, 2004, and 2005, listed below:

USDA CSREES Special Grant, 2003-34172-14053l; $113,672.00
USDA CSREES Special Grant, 2004-34172-15187; $105,866.00
USDA CSREES Special Grant, 2005-34172-16441; $104,637.00

Cooperating Agencies and Organizations
Hawai‘i Department of Agriculture
Hawai‘i Department of Land and Natural Resources, Division of Fish and Wildlife
Hawai‘i Department of Hawaiian Home Lands
USDA, Natural Resources Conservation Service
USDA, Animal and Plant Health Inspection Service
Hawaii Cattlemen’s Council, Inc.
Hawaii Cattlemen’s Association
Maui Cattlemen’s Association
Hawaii Grazing Lands Conservation Initiative Coalition
Hawaii Cattle Producers Cooperative Association

Ranch and Allied Industry Collaborators
Kahua Ranch, Ltd.
Ponoholo Ranch
Olumau Angus Plus, LLC
Kuahiwimalu Ranch
S. Akana Ranch
Princeville Ranch
Haleakala Ranch
Habein Livestock Co.
Maui Cattle Company
Kulana Foods, Ltd.
Hawaii Big Island Beef
Pu’uwa’awa’a Ranch
Beef and Blooms
Ms. Joan Namkoong

Mainland Research and Extension Partners
Tyson Fresh Meats, Wallula, Washington
Bruneau Cattle Co., Bruneau, Idaho
Swanton Pacific Ranch, Davenport, California
Rocky Mountain Institute, Snowmass, Colorado
Biotronics, Inc., Ames, Iowa

Program Equipment Acquisitions
No-till, pasture and range seed drill
Sono-Vet portable ultrasound unit