

CTAHR

Beef Initiative

2006 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.

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Introduction

The CTAHR Beef Initiative is a major endeavor and commitment of the University of Hawai‘i at Mānoa’s College of Tropical Agriculture and Human Resources to partner with the Hawai‘i beef industry in stimulating growth, economic diversification, and environmental sustainability for agriculture in the state. The initiative is inspired by Dean Andrew Hashimoto’s belief that the beef industry will continue to be a leader for the vision of 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

1. Developing and implementing effective research and innovative extension programs for animal production in Hawai‘i and other tropical regions.
2. Improving communications between the beef industry, interagency partners, and CTAHR.
3. Supporting the industry on legislative and other governmental issues, policies, and partnerships.

CTAHR’s team of researchers and extension educators encourage you to review our accomplishments in 2006. We believe that we have made significant contributions to the knowledge base of beef cattle production and marketing in Hawai‘i in just three years of the program. We welcome input, comments, and suggestions from the communities we serve through this program. Please visit our website at www.ctahr.hawaii.edu/paniolo.

Program Areas Include

Economics and Marketing, Pastoral Systems, Genetics and DNA Technology, Meat Science and Technology, Outreach, Value-Added Product Development, and Mealani Research Station. Future areas include: New Product Evaluation, Emerging Technologies, Feed Resource Development.

Economics and Marketing

Calf-XL: Cost of Production and Economic Decision Tool Available on the CTAHR Website.

Linda J. Cox

The foundation for success of any business is an understanding and knowledge of expenses and revenues. While this financial information is a key component of effective decision-making, many producers find the process of assembling the information and putting it into a usable format to be formidable.



Objectives

1. Determine the estimated 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

Calf-XL, an Excel based cost-of-production calculator, is now available for download from the CTAHR website at <http://www.ctahr.hawaii.edu/freepubs>; select Livestock Management and then select “download spreadsheet program.” A user’s guide is also available on the website at <http://www.ctahr.hawaii.edu/oc/freepubs/pdf/LM-12.pdf>. In addition to this web resource, a CD is available upon request. Contact Dr. Linda J. Cox, Community Economic Development Specialist, by e-mail at lcx@hawaii.edu for the CD. Thanks to the following cooperators for providing invaluable feedback during the beta testing of Calf-XL: Ponoholo Ranch, Habein Livestock Co., Bill Chambers of Kuahiwimalu Ranch, and Spencer Akana Ranch.

The pilot version of Beef-XL, an Excel-based workbook that allows users to analyze various marketing options, is ready for testing and distribution. The workbook evaluates various marketing alternatives faced by ranchers in Hawai‘i and analyzes the “bottom-line” returns to the producer. Beef XL analyzes various market scenarios in Hawai‘i, including sell calves at weaning, background on forage, retained ownership through feedlot finish and retained ownership through forage finish, and market scenarios in the mainland including background on forage, retained ownership through feedlot finish, and market alliance scenarios. Beef-XL was presented at the 2006 Mealani Forage Field Day.

Report Summary

Calf-XL was developed in order to assist ranchers in determining their cost of production. It is described in the publication entitled *Commercial Cow-Calf Decisions: Calculating the Cost of Production for a Cow-Calf Operation* (CTAHR publication LM-12). The publication also includes an example to illustrate the usefulness of the Calf-XL to producers.

Beef-XL is designed so that producers can enter the costs associated with various marketing options and quickly calculate the cost of each option. Beef-XL is organized to complement Calf-XL. Beef-XL contains eleven worksheets, with eight that require the user to enter information. Beef-XL is now ready for testing, and a draft of the user guide has been completed.

Value-Added Product Development

Hawaiian Beef Stew Omiyage (Gift)? It's Possible Using the Flexible Retort Pouch Technology

Linda J. Cox, Soojin Jun, and Alvin Huang

Objectives

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

Activities, Progress, and Results

Research on flexible retort pouches was completed and summarized. The report is available on the CTAHR website.

A flexible retort pouch prototype was developed and sampled at the 2006 Mealani Forage Field Day.

Report Summary

In response to issues raised by producers, processors, wholesalers, and retailers, research was conducted on methodologies that would allow value to be added to the less desirable cuts of beef. Since these less desirable cuts generally are not consistent in quality, processing methods that can eliminate quality variations are desirable. At the same time, value will be added if the shelf life of the beef can be extended.

Flexible retort pouch technology is a processing option that could possibly address the challenges faced in adding value to various cuts of beef. A thorough investigation of pouches was completed and is found in *Using the Flexible Retort Pouch to Add Value to Agricultural Products* (CTAHR publication FST-18). Some locally produced beef was obtained and used to prepare a prototype of pouched beef. Attendees at the 2006 Mealani Forage Field Day sampled the product. The product received good reviews from those who tasted it.



Pastoral Systems

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

Mark S. Thorne, Linda J. Cox, Jonathan Deenik, and Harold Keyser

For the efficient remediation and conversion of former sugarcane and pineapple lands into sustainable grazing systems, there is an immediate need to develop a series of Best Management Practices (BMPs). Current soil remediation recommendations (addition of fertilizer and lime) are based on maximizing crop production and are, therefore, not economical for livestock producers. Moreover, the recommended rates (based on maximizing crop production) are typically greater than what is needed for sustainable forage production and livestock grazing systems. Thus, these BMPs would include appropriate and economical liming and fertilizer rates and incorporation of forage legumes in combination with rotational grazing to facilitate the remediation of former sugarcane and pineapple land into sustainable livestock production systems.

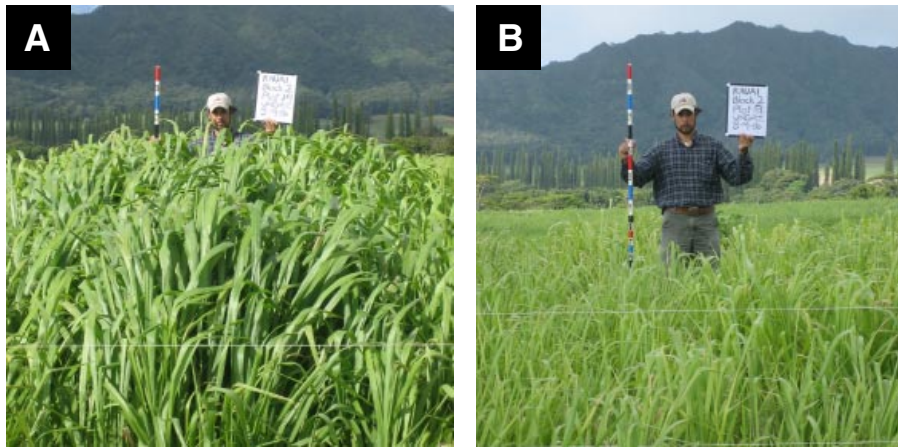
Objectives

1. Determine the most economical and efficient combination of treatments, including applications of lime and fertilizer, inter-seeding of legumes, and grazing management, that allows for the efficient conversion of former sugarcane and pineapple lands on the islands of Hawai‘i, Kaua‘i, and Maui into sustainable forage production systems.
2. Determine the long-term effects and interactions among treatments on soil fertility, forage production, and animal production standards as they relate to sustainable forage production.
3. Determine the long-term effects of the different treatments on the ecology of improved pasture ecosystems.
3. Develop a series of recommendations or Best Management Practices for livestock producers, county extension agents, and federal land management personnel to efficiently remediate and convert former sugarcane and pineapple lands into sustainable forage production systems.



Work on this project started in August 2005 and will terminate in August 2008. Treatments were applied on the island of Hawai‘i on former sugarcane lands in December of 2005 and January 2006. On Kaua‘i and Maui, treatments were applied March and May of 2006. Initial results reveal that even light applications of N and lime have a dramatic impact on forage production. For example, in the first three to four months following treatments on Kaua‘i, plots treated at just 150 lb of urea (46% available N) produced over 10 tons/acre of biomass more than the untreated plots (see Figure). In addition, cattle utilization appears to be greater in the lime and N treated plots than in the untreated plots. Even at the lowest treatment rates, the additional 10 tons/acre provides an additional 25 Animal Unit Months (AUMs) of grazing. This could be economically significant for ranchers given the low

cost associated with these application rates (between \$90 and \$200/acre, depending on application rates). Work on this project continues with subsequent sampling periods at 6, 9, 12, and 18 months post-treatment. This project is funded through the USDA–CSREES Tropical and Subtropical Agriculture Research Grant Program in the amount of \$262,013.



Production on two different plots 3 months post-treatment at the Kaua‘i site. (A) high nitrogen, low lime (left); (B) no nitrogen, low lime (right).

Hawaii Animal Nutrition and Forage Production Profiling Project

Mark Thorne

Forage-based beef cattle production is an important component of the economy and environment in Hawai‘i. Indeed, there are over 1 million acres of grazing land in Hawai‘i currently utilized for livestock production. Grazing lands are characterized as those lands capable of growing grasses and other forages. 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 (PAR), 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 these soil-plant-animal interactions is needed. The primary goal of this project is to correlate various animal nutrition and performance indicators with key forage production values. These associated indicators, or profiles, will help producers make pro-active decisions about their management practices, allowing them to make changes rapidly without affecting animal performance.

Work on this project over the past two years has focused on collecting animal performance measures from the replacement heifers at the Mealani Research Station and forage quantity and quality parameters in the pastures they utilized. Though not all of the data from this project have been analyzed, trends in animal performance and forage quality are tightly linked and seasonally dependent at Mealani. While this may be expected, the information allows us to develop a profile of

the seasonal variability in forage quality and quantity that will aid in maintaining animal performance at peak levels. Further analyses of the project data will facilitate the development of information on grazing management strategies that will help producers maintain high levels of forage quality and quantity throughout the production year for tropical pasture systems; information that is currently very limited. The results of this project will also be broadly applicable across the diversity of cattle operations in Hawai'i including not only cow-calf producers but stocker-finisher and seed-stock operations as well.

Funding for this project, \$17,110, was provided by the USDA–Natural Resources Conservation Service through the Grazing Lands Conservation Initiative. Work on this project began in June 2005 and will terminate in May 2007. Project Directors: Dr. Mark S. Thorne; Dr. James R. Carpenter; Joe May, NRCS State Range Conservationist, Hawai'i; Arnold Norman, NRCS Central Region Range-lands Specialist.

Pasture Weed Control: Kaua'i County

Lincoln Ching

Invasive tufted beard grass (*Schizachrium condensatum*) continues to spread across the island of Kaua'i. First noticed on higher elevations in Koke'e, seed distribution and growth was greatly enhanced by Hurricane Iniki in 1992. It continues to spread on Kaua'i and is visible from the north (Hanalei) to the east (Wailua) and the south (Koloa).

While it can be controlled by the herbicide glyphosate, care must be taken during the application, as glyphosate will also kill most of the desirable forages needed for livestock grazing. After viewing its growth habit over the past few years, it is clear that producers must prevent its establishment. Once established, it is very difficult to control, and complete pasture renovation must be undertaken to reclaim productive units.

Dr. Mark Thorne, Extension Specialist in Pasture and Range Management, recently initiated a T-STAR research project on Kaua'i on the reclamation of former sugarcane lands for pasture production. The primary forage on the Kaua'i test trial is guineagrass (*Panicum maximum*). Upon completion, this test should provide information on how different rates of soil amendments, established legumes, and fertility affect guineagrass production and how this production can possibly compete with tufted beard grass contained in the treatments.

Aramina (*Urena lobata*) is an herbaceous broadleaf shrub that grows up to 6 feet tall. It produces hemispherical fruiting burrs with hooks aiding in its transport and spread and is another aggressive invasive weed Kaua'i producers must contend with. Heavy concentrations can be found in the eastern (Kapa'a) and southeastern (Kilohana) sections of Kaua'i. Previous herbicide trials in cooperation with Dr. Phillip Motooka, retired Extension Specialist in Weed Science, have shown that the best control of aramina under drizzle application was the use of triclopyr in comparison to dicamba and mcpa4 selective systemic herbicides.

A recent test has shown that a newly approved selective systemic herbicide called aminopyralid applied as a foliar application is very effective in the control of aramina. A more economical drizzle application method with aminopyralid will be tested in the future.

Pasture Weed Control: Multi-Species Grazing, Mechanical and Chemical Methods, Maui County

John Powley

Gorse, *Ulex europaeus*, is a range and pasture weed problem on Maui's high-elevation pastoral locations. Haleakala Ranch has developed a multi-species, rotational-grazing weed control system to assist in rearranging the forage species profile available for the beef herds. A combination of weed control methods will be incorporated into the planned management strategy.

Six half-acre plots were established in the gorse-infested pastures. The initial mechanical control method included the use of a "Slash Buster," which can grind the woody plants down to a few inches above the ground. Spike® (tebutirion) herbicide application followed the mechanical treatment method at 8 lb/acre. Spike has been applied on undisturbed gorse with little positive result in early trials in Olinda and Humu'ula. It is not known if the active ingredient in Spike is effective on gorse or if the large mass of surface roots is able to maintain the plant while the deeper taproots outlive the chemical.

New leguminous shoots are readily eaten by goats to eliminate the source of food from these shoots for the plant. The Spike then should be taken up by the deeper roots to stop the main plant stem from re-growing for a month while the goats and sheep are on their rotational grazing pattern. Evaluation of the plots will continue during 2007.

Maui Cattlemen's Association Feed Task Force Update

John Powley

A Case RBX 453 round baler capable of making 800- to 1000-lb bales has arrived and was demonstrated on December 9, 2006, at an HC&S seed cane field. An operator and rubber tire tractor is under contract on an as-needed basis. Cost per bale is still being calculated. The baler worked well, and the large amount of cane tops on the field did not necessitate windrowing or raking. Estimated weight per bales was 900 pounds. The bales were rolled into a gooseneck-type livestock trailer, stood up on end, and hauled to one to the cooperating ranches. Several factors (moisture of the baled material, size of the bale, and size of the trailer) constrain the movement of the bales. All bales can be utilized as cattle feed. Spoiled, mildewed, rotted, or otherwise unacceptable bales can be ground and burned for energy generation at the HC&S facility.

Working with a grant from the Maui County RC&D and USDA, additional equipment, including a loader fork and a round bale wrapper on a 20 (rancher investment)/80 cost-share basis will be purchased for the Maui Cattlemen's Association project.

Genetics and DNA Technology

DNA-based Genetic Analysis and Selection Tools

Jinzeng Yang, Robert Ferreira, Mike DuPont, Glen Fukumoto

Objectives

In the beef cattle industry, cattle breeds and genetic makeup have significant impacts on the industry and the profit of cattle production operations. An organized genetic program for seedstock cattle breeders in Hawaii is necessary for the benefit of the entire Hawaii beef cattle industry. The development of DNA-based genetic analysis for production traits will not only speed up genetic progress, but also establish breeding programs with genotype performances. The primary objective this project for the past



year is to identify and test 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, and (3) analysis of growth hormone receptor polymorphisms in relation to calf growth performance. Research data were presented to the Joint Annual Meeting of the American Society of Animal Science in 2006. To increase the sample size, we have not only maintained the Angus cattle population at the Mealani Research Station but have also collaborated with private seedstock cattle ranches. In 2006, we successfully bred 94 cows with a 100% pregnancy rate and calving rate in the station. We collected blood samples from more than 600 cattle from Hawai'i and Kaua'i, with more than 200 Angus Plus and Angus cattle having growth performance data and records. All of the genomic DNA isolations from these cattle have been completed.

Calf Growth Performance Data Analysis

A statistical summary of growth performances of the Angus Plus herd for year 2003, 2004, 2005, and 2006 is reported in Table 1. We also collected calf growth performance data from Mealani. The data are summarized in Table 2. The station now has been working toward establishment of an Angus cattle population. By studying both populations, we expect a large genetic diversity for the designed DNA polymorphisms present in the cattle populations.

Analysis of Growth Hormone Receptor (GHR) Polymorphisms

Growth hormone receptor (GHR) plays a vital role in growth and metabolism by interacting with growth hormone. This project is actively investigating DNA markers in the regulatory region of GHR gene, with the goal of identifying cattle with superior growth traits. By specific laboratory procedures that include DNA isolation from individual cattle blood sample, PCR reaction and DNA sequence

Table 1. Growth performance of Angus Plus on 100% pasture.

Traits	Year 2003	Year 2004	Year 2005	Year 2006
No. of Cattle	23	62	64	46
Birth Weight, lb	81.7 ± 2.73	76.4 ± 1.13	75.3 ± 1.12	75.87 ± 0.98
Hip Hight at Birth, Inches	28.9 ± 0.18	28.5 ± 0.09	28.3 ± 0.08	28.41 ± 0.07
Weaning Age, Day	201.3 ± 19.86	215.8 ± 4.19	213.1 ± 2.75	202.0 ± 2.28
Weaning Weight, lb	540.4 ± 19.32	501.6 ± 8.53	559.2 ± 9.34	536.26 ± 7.30
Weaning Hip Height, inches	43.2 ± 0.32	44.2 ± 0.23	42.8 ± 0.24	43.00 ± 0.19
205d-Adjusted Weigh, lb	557.4 ± 14.62	585.1 ± 8.69	545.5 ± 7.51	N/A
Average Daily Gain, lb	2.31 ± 0.06	2.42 ± 0.29	2.31 ± 0.33	2.28 ± 0.03

Table 2. Growth performances of calves on 100% pasture at Mealani Station (2006).

Breed	Angus	Angus	Composite
No. of Cattle	18	17	23
Birth Weight, lb	86.61 ± 1.93 ^a	79.94 ± 1.82 ^b	83.78 ± 2.52 ^b
Weaning Weight, lb	499.22 ± 18.65 ^a	513.71 ± 13.78 ^a	517.70 ± 8.86 ^a
Weaning Age, day	190.39 ± 3.51 ^a	199.47 ± 3.40 ^{ab}	202.74 ± 1.82 ^b
205d-Adjusted Weigh, lb	553.6 ± 10.22 ^a	539.82 ± 12.6 ^b	526.74 ± 8.70 ^b
205d-Adjusted Weigh Ratio, %	105.67 ± 1.98 ^a	102.65 ± 2.48 ^b	99.78 ± 1.68 ^b
Average Daily Gain, lb/d	2.15 ± 0.06 ^a	2.18 ± 0.07 ^a	2.13 ± 0.04 ^a

fragment analysis, we have identified and classified two forms (or alleles) of GHR polymorphism: the long (L) and short (S) forms.

A simple example of genetic expression is in horned versus polled cattle, where we have H (horn) alleles and P (polled) alleles resulting in a combination of HH, HP, and PP. If H is dominant, you will have 1 HH, 2 HP, and 1 PP, so only one-fourth of the cattle are polled. The genotype of DNA markers is not as dramatic as the gene expression of horns in cattle, since "polled-ness" may be only controlled by one gene. Many genes control growth traits, so we are looking for one marker now (GHR).

Analysis of performance data of the Angus Plus cattle herd showed that cattle with SS genotypes performed better than LL cattle. The weaning weight of the SS genotype was significantly greater than cattle with the LL genotype ($P = 0.03$), and the 205-d adjusted hip height of the SS genotype is significantly higher than those cattle with the LL genotype ($P = 0.0014$) or the SL genotype ($P = 0.016$). Allele frequency shows that the population is skewed toward the L allele (frequency of the L allele =

0.797). More work is needed in this area, and efforts will continue through the term of the project. This work will lead to a practical application of the DNA-based testing tool for beef cattle genetic improvement in Hawai‘i.

Plans for the Coming Year

We will continue our research plan in GHR studies and further expand the analysis of GHR polymorphisms to all the cattle samples from Angus Plus and Angus populations. In addition, we are also interested in investigating the expression levels of genes that are related to meat tenderness. The tenderness of beef meat or muscle is the main factors that cause the “juicy” taste experiences during eating. It is a highly desirable trait of beef meat by consumers. Single-nucleotide polymorphisms in micromolar calcium activated neutral protease (CAPN1) have been reported to be associated with beef meat tenderness. We are planning to run feeding experiments and to analyze the expression levels of CAPN1 in muscle tissue.

Publications/presentations

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.

Acknowledgments

Special thanks to Olumau Angus Plus, LLC, and CTAHR Mealani Research Station for recording growth data and blood sample collections. We thank Milton Yamasaki, Marla Fegerstrom, Lincoln Ching, and Dr. Mark Thorne for their assistance in the project. We are grateful to Baoping Zhao and Jin K Lee for their technical assistance in identification of GHR polymorphisms and data analysis.

Meat Science and Technology

Nutritional and Eating Quality of Locally Produced, Forage-Finished Beef

Yong S. Kim; Glen K. Fukumoto, and Michael W. DuPont.

Objectives

1. To examine the tenderness of forage-finished beef produced in Hawai'i.
2. To investigate the intrinsic and extrinsic factors affecting the tenderness of forage-finished beef produced in Hawaii.
3. To measure CLA content and polyunsaturated fatty acid composition in forage-finished beef produced in Hawai'i.



Activities and Accomplishments

Hawaii grass-finish beef tenderness study

A total of 191 cattle were sampled during an 18-month period from the fall of 2004 to winter of 2006. Two ribeye steak samples at the 12th rib were collected; one for tenderness evaluation and the other for chemical composition. Measurement of shear force value of cooked steak and proximate analysis were completed. A sub-sample of ten subcutaneous fat and ribeye muscle samples was sent to cooperating scientist Dr. Junghan Kim's laboratory at the Seoul National University for measurement of conjugated linoleic acid concentration. A manuscript of the research work is in the final draft phase and will be published in the first half of 2007. Preliminary results show a wide variation in shear force measurements for the grass-finish beef samples. According to a study by Miller et al. (2001), which evaluated consumer thresholds for establishing the value of beef tenderness, consumer preference for beef tenderness falls within a very small range. Shear force values of 3.4, 4.0, and 4.3 kg of strip loin steaks cooked in an electric broiler would result in 99, 94 and 86 percent of consumer satisfaction for beef tenderness. About 35 percent of our samples had shear values below 4.4 kg in water bath cooking.

Other research work

Currently, muscle protein fractionation patterns between tender and tough meat are being analyzed using the SDS-PAGE method to examine whether protein markers for meat tenderness exist.

Outreach

Hawaii Grazing and Livestock Management Academy

Mark Thorne

Purpose and Goals

The purpose of the Hawaiian Grazing and Livestock Management Academy is to provide an education program to 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. Development of the program materials has taken longer than anticipated, and a no-cost extension was requested and granted in order to complete the work. The program materials are being finalized, and workshops are planned to begin in June 2007. Workshop topics will include an



introduction on pasture forage growth and management, principles of grazing management, grazing animal behavior, range and pasture animal nutrition, grazing management planning, and monitoring range and pasture condition. Workshops will include classroom and field work in two-day sessions.

This educational outreach project is supported by the USDA-Natural Resources Conservation Service. Funding for this project is \$53,152. The project began in October 2004 and has been extended through September 2007. The project director is Dr. Mark S. Thorne; project cooperators are Glen Fukumoto, Mike DuPonte, Lincoln Ching, John Powley, and Glenn Teves; the beef industry cooperator is Greg Friel.

2006 Mealani Forage Field Day

Mark Thorne

Mealani Forage Field Day is an annual educational outreach program that provides 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 consumers about the benefits of forage-based animal production systems: healthy foods, healthy economy, healthy environment (socially sustainable).

The focus of the 2006 Mealani Forage Field Day was on “Hawai‘I-Grown Beef: From Pasture to Market.” The program featured Steve Keville, the National Meat Coordinator for Whole Foods Markets, Inc. He provided information on market potential and strategies for Hawai‘I-grown beef as well as insight into the philosophy and success of Whole Foods. This was followed by introductions and brief statements by program sponsors, vendors, and individuals with organizational and educational displays. Attendees had time to view and discuss the information displayed by these individuals. Closing up the morning session were two presentations introducing new CTAHR tools and technologies. First, CTAHR’s Dr. Linda Cox provided a presentation on “*Evaluating Market Options With A Ranch Production Cost Analysis.*” Agricultural Extension Agent Mike DuPonte gave a presentation on “*Evaluating Beef Production Traits Using Ultra-Sound Technology.*” Both issues are critical for the continued sustainability of the Hawai‘i cattle industry.

The afternoon session included a variety of field demonstrations including a pasture walk, a tour of the Kx2 Leucaena grazing trials, and a demonstration on the use of a range drill for improving pastures. The proceedings of the field day program was published and is available through the Kamuela Extension Office.

National Animal Identification System Outreach and Education Project

Mark Thorne and Matthew Stevenson

In October 2005 the UH-CTAHR Cooperative Extension Service entered into an agreement with the Hawai‘i Department of Agriculture to conduct an education and outreach program on the Hawai‘i Premises Identification System the state was implementing as part of the National Animal Identification System (NAIS). Although the contract period was to be for one year beginning on October 25, 2005 and ending October 24, 2006, the contract was not finalized and fully executed until December 5, 2005. The delay in finalizing the contract and establishment of an account (received 12/20/2005) within the university system led to delays in initiating the project and the hiring of the associated support personnel.



Between June 19 and September 9, 2006, seven workshops were held. Locations and dates for these workshops were: Hilo, June 19; Kamuela, June 22; Kahului July 17; Moloka‘i, July 18; Lihue, August 10; Kaneohe, September 7; Kapolei, September 9.

Workshop Impact and Evaluations

At each workshop a pre- and post-workshop evaluation was conducted. Of the 73 (registered) individuals attending the workshops 36 (49%) returned the pre-workshop evaluation and 29 (40%) filled

out the post-workshop evaluation. More than 75 percent of the respondents indicated that they had a better understanding and perspective of the NAIS following the workshop than they did before the workshop. Only five respondents indicated that they filled out their premise registration forms at the meeting, but 34 percent of those filling out the evaluations indicated that they would register their premises. Of the post-workshop respondents, 76 percent indicated that they prefer the program to remain voluntary.

The majority of respondents have indicated the workshop clearly explained the NAIS program and that all or most of their questions were adequately answered. Most indicated they would attend another workshop on the NAIS, though not one about premise registration. Funding in the amount of \$81,200.00 was provided for this project by the Hawai'i Department of Agriculture in cooperation with the USDA–NAIS program. A new contract for a second year of funding (\$45,000) to continue the work is currently being drafted.

Ultrasound Technology Educational Workshops

Michael DuPont

Through the CTAHR Beef Initiative Program a Sonovet 2000 ultrasound unit was acquired for use in Hawai'i. With the cooperation with Dr. Doyle Wilson, beef specialist emeritus from Iowa State University and current president of Biotronics, Inc., an ultrasound technology workshop was held at the Mealani Research Station and attended by livestock agents, researchers, agricultural technicians, graduate students, and several beef producers. The objectives of the initial workshop were to learn about the historic development of ultrasound as a selection tool in beef cattle and to familiarize participants with the use of equipment and software and conduct the step by step procedures involved in live scanning of cattle. The strengths of the ultrasound technology in genetic selection programs are to identify carcass traits (rib eye size, backfat thickness and marbling score) in live yearling cattle and to increase consistency of carcass traits by identifying market-ready cattle in the feedlot.



Following the training workshop, three industry outreach workshops were held on Maui, Kaua'i and Moloka'i. The objectives of these workshops were to (1) introduce the industry to the ultrasound technology and its application in herd genetic improvement programs, and (2) engage with potential ranch cooperators interested in the use of the technology to enhance selection of key carcass traits. Through the CTAHR Beef Initiative Program, the project leader has developed plans to have an Ultrasound Guidelines Council (UGC) certified ultrasound technician in place in Hawai'i by late 2007 or early 2008. Only official certified ultrasound data can be sent to centralized ultrasound

processing laboratories for interpretation and use by breed associations for the calculations of body composition/carcass EPDs. Certification will allow interested producers to gather individual animal information to develop these carcass EPDs for grass-fed genetics by the various national breed associations. Currently, Hawai‘i has been pinpointed as one of the leaders nationwide for high-quality graded beef. Mainland feedlots have allocated high marks to the percentage of Hawai‘i cattle graded “Choice or better” throughout the United States. The long-term goal of this project, through the combination of certified ultrasound data, DNA-based genetic analysis of production traits, and tenderness studies, is to identify superior genetics for growth and carcass characteristics of beef cattle based on forage production.

Mealani’s A Taste of the Hawaiian Range Festival Draws Large, Hungry Crowd

Glen Fukumoto

On October 6, the 11th annual Mealani’s A Taste of the Hawaiian Range was held at Hilton Waikoloa Village on the Big Island’s Kohala Coast. A capacity crowd of about 2,200 people participated in the food festival, which raises consumer awareness of Hawai‘i’s forage-fed meats and island-fresh produce. Twenty-nine chefs lent their skills to the event, tackling unusual cuts of meat, while 38 displays highlighted Hawai‘i products.



This year inaugurated the Kohala Mountain Oyster Cook-off. The winner was Jeri-Ann Moniz of KK Ranch for breaded, pan-fried mountain oysters served with a side dish of raw mountain oysters prepared with a vinegar, shoyu, and chili pepper sauce on a bed of round onion, tomato, and chopped parsley. CTAHR’s own Mark Thorne was the runner-up, and Jessie Hoopai of L5 Ranch took third place. The contest was judged by the Honolulu Star-Bulletin’s Joan Namkoong, Hilton Waikoloa Village’s Willy Pirngruber, and Deston Nokes, an Associated Press journalist from Portland, Oregon. Mr. Lyman Medeiros was the evening’s emcee.

For the fourth year, the Taste honored Hawai‘i producers. The 2006 Outstanding Rancher Award went to Mike Tomich, while the 2006 Outstanding Farmer Award was received by Donna and Joey Mah (J&D Farm).

We thank the Taste’s planning committee whose hard work made this year’s Taste such a memorable event. Community members included Rick Habein (Habein Livestock Co.), Tom Asano (Kulana Foods, Ltd.), Lorie Farrell (Big Island Farm Bureau), and the Hilton Waikoloa Village Resort

team including Willy Pirngruber, Michael Blaksteen, Len Hiraoka, Fred Lau, Chef Kenneth Omiya, Leanne Pletcher, and Meredith Wertz. CTAHR planning committee members included Michael DuPonte, Mark Thorne, and Glen Fukumoto (Human Nutrition, Food and Animal Sciences/Hawai'i County), Randy Hamasaki (Plant and Environmental Protection Sciences/Hawai'i County), Merrissa Uchimura (Office of Communication Services), and Milton Yamasaki (Hawai'i County). Mahalo also to the event sponsors and to the County of Hawai'i's Department of Research and Development and the Hawai'i County Council for their support.

Industry Collaborative Projects: Kaua'i

Lincoln Ching

Livestock holding facility: Shipment of weaned cattle from Kaua'i has been on the increase since much of the former sugarcane lands have converted to pasture production. The latest statistics (2004) available online from the National Agricultural Statistics Service indicate 4,800 cattle and calves were sold from Kaua'i. Of these sales, an estimated 3,500 head were shipped from Kaua'i as weaned calves for the West Coast mainland market. Without a common shipping facility, the majority of producers weigh calves in individual trailers and transport these calves to the shipping port of Nawiliwili for loading into "cowtainers" for overseas shipment to O'ahu and the West Coast.

It takes an average of four gooseneck trailers to fill one "cowtainer." With a total of 54 cowtainers per year to ship out the 3,500 weaned calves, over 200 trailer loads to the pier were undertaken. Fortunately, no major mishaps or escapes occurred among these numerous loads.

To avoid the possibility of mishaps at the pier, Kaua'i Cattlemen's Association investigated the possibility of establishing a holding/shipping facility. After selecting a location, the association, through CTAHR assistance, obtained two grants totaling \$30,000 from the County of Kaua'i. Additionally, a gratis license between Grove Farm Company, Inc. and the Kaua'i Cattlemen's Association was signed for approximately 3 acres of land for the project. A weighing pen, several holding pens, and a loading chute are being completed to accommodate "cowtainers" and double-decked livestock transport trailers.

The holding facility is situated in Hanamaulu, on the grounds of Makoa Ranch, just a few miles from the Port of Nawiliwili. In support of this project, the membership's in-kind matching includes equipment, planning, and labor in establishing the facility. It should be completed in the near future.

Mealani Research Station

Healthy Food Production Systems: Engaging in Industry and Community Awareness

Glen Fukumoto and Milton Yamasaki

In 2006, more than 600 visitors made the trek to Waimea and toured the facilities at the Mealani Research Station, one of eight CTAHR research facilities on the Big Island and one of seventeen strategically placed research stations throughout the state of Hawai‘i. Last year we’ve seen many local Big Island residents, kama‘aina from all major Hawaiian islands, visitors from all regions of the U.S. mainland (CA, NY, GA, CO, MI, OR, VT, NM, ID, WA) and international visitors from Taiwan, Japan, China, Russia, Seychelles, Africa, Australia, New Zealand, South Pacific Islands,



and the Azores. The Mealani Research Station is not listed on any tourist guide—so what’s the draw?

With attention from local and statewide media organizations and a feature on Pacific Fusion television, the word is getting out. Healthy foods are in!

The “Baby Boomer” generation (born between 1948 and 1964) is defining today’s new marketplace for healthier foods and functional foods, driving demand for anti-aging, and memory- and vision-enhancement products; they are concerned about health and are shopping for healthier foods, as evidenced by the demands for organic, natural, and functional foods. Functional foods are foods that provide a health benefit beyond basic nutritional needs. Food components such as omega-3 fatty acids, conjugated linoleic acids, anti-oxidants, and other compounds have been popularized as having benefits to human health.

A few years ago, bold new directives were put up as a challenge for change at the Mealani Research Station, and CTAHR faculty, staff, and administration embraced the paradigm shift toward an open, community- and industry-oriented approach to research and outreach efforts. A vision statement was established for Mealani: “Provide a venue for innovative and creative research and outreach programs enabling it to be the leader in the development of healthy food and urban-friendly production systems that will result in healthy communities, sustainable ecosystems, and economic vitality for the state of Hawai‘i and the Pacific.”

Applied research projects in Hawai‘i grass-finished beef, green tea, and blueberry all fit the functional-foods model and are causing excitement in Hawai‘i and beyond. Most visitors are very impressed with the visionary work in healthy and functional foods and are often lucky enough to actually get a taste or sip of these quality products.

CTAHR Beef Initiative—2006 Accomplishments

The foundation research work at Mealani, in the three major focal areas, will help to provide applicable information and leadership for the establishment of new agricultural tea and blueberry industries in Hawai'i and continue to contribute to the Hawai'i beef industry. The intent of these projects is to move away from the typical commodity product toward high-value, high-quality Hawai'i products using their healthy chemical components, emerging research on human health benefits, and a network of food-industry and chef contacts to continue the educational mission of the Mealani vision.



Visiting animal science students from California Polytechnic State University at San Luis Obispo, with Dr. Jonathan Beckett, learning from Dr. Mark Thorne (at right) about tropical/subtropical beef cattle production at the Mealani Research Station.

Scholarly Achievements: 2006

Publications, Proceedings, and Other Reports

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Miyasaka, Susan C., James D. Hansen, and Glen K. Fukumoto. Resistance to yellow sugarcane aphid: Screening kikuyu and other grasses. *J. Crop Protection*.

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Project Websites

CTAHR Beef Initiative Program: <http://www.ctahr.hawaii.edu/paniolo>

Mealani's A Taste of the Hawaiian Range Agricultural Festival: <http://www.ctahr.hawaii.edu/taste>

Hawaii Rangelands: <http://rangelands.manoa.hawaii.edu>

Oral and Poster Presentations, Seminars, Workshops, Facilitations

Cox, Linda J. Evaluating market options with a ranch production cost analysis. A half-hour presentation at the 2006 Mealani Forage Field Day, October 7, 2006, Kamuela, Hawai'i.

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International

Yong Soo Kim. 2006, June 9, Jinju, Korea, H-J-T (Hawaii, Jinju, and Texas Tech University) International Joint Symposium on Current and Future Directions in Animal Production and Research, Title of presentation: Meat quality characteristics of grain- and forage-finished beef; (invited).

National

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State

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Thorne, Mark S. (P.I.) Hawaii Program for the National Animal Identification System Workshops. Cooperative Extension Service, CTAHR, University of Hawai'i at Mānoa, 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; and O'ahu, September 7.

Fukumoto, Glen 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.)

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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.

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

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

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

Pending Research Proposals

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.

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Thorne, M.S., T. Miura, J.L. Deenik, and J. Powley. 2007. Development of best management practices for control of Madagascar fireweed (*Senecio madagascariensis* Poiret) in Maui County. Maui County R&D, \$34,056.

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National and International Collaborations

Rangelands West Partnership, Multistate Research Project, WERA1008, March 2006.

Society for Range Management Annual Meeting, Vancouver, Canada, February 2006.

Pest Management Strategic Plan for Forage Production in the Western Region. Coordinated by the University of Idaho, Boise, ID, February 2006.

Ultrasound Technology Training and Certification. Iowa State University and Biotronics, Inc., Ames, IA. Dr. Doyle Wilson, March 2006.

Conjugated linoleic acid (CLA) concentration and fatty acid composition analyses in Hawaiian grass-finished beef. Department of Applied Biology and Chemistry, College of Agriculture and Life Science, Seoul National University, Seoul, Korea. Dr. Junghan Kim. June 2006.

Beef cattle performance research. In cooperation with California Polytechnic State University, San Luis Obispo, CA, Dr. Jonathan Beckett, and Kahua Ranch, Ltd., Dr. Tim Richards. January 2007.

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FUNDED BY

USDA CSREES Special Grant, 2004-34172-15187
Hawaii Agricultural Diversification—New Crop/
Product Development and Marketing.

COOPERATING AGENCIES

Hawai'i Department of Agriculture
Hawai'i Department of Land and Natural Resources,
Division of Fish and Wildlife
USDA, Natural Resources Conservation Service
Hawai'i Cattlemen's Council, Inc.
Hawai'i Cattlemen's Association
Maui Cattlemen's Association
Hawai'i Grazing Lands Conservation Initiative
Coalition



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