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THE POTENTIAL IMPACT OF AIR FREIGHT REDUCTIONS ON RANCH INCOME IN HAWAII

by

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At the present time, only two production methods are utilized by Hawaiian ranchers. They can range or grass fatten their stock, which is to allow the animals to remain on pasture until they attain sufficient weight to warrant their slaughter. Or they can grow the animals on range and confine them for final fattening on concentrate rations. At present this operation requires yearlings to be transported by barge to Honolulu, placed in a feedlot and fed concentrates for a period of between 110 and 150 days. Fed animals at slaughter are expected to grade **choice** or **good**. The time they spend in the feedlot depends upon their gaining ability and their body weight when they enter the feedlot.

Hawaiian cattle producers have been forced to operate in relative isolation because of the distance to the Mainland. There is only one feedlot in Hawaii that does custom feeding and only one Federally inspected slaughterhouse in the Islands. Thus, the Hawaiian rancher can only improve his economic position by ranch management decisions that will lower costs since off-ranch price of feeding and slaughter are relatively fixed. By taking advantage of new technology in containerization and air transportation, ranchers in Hawaii may soon be able to finish and market feeders (calves) on the Mainland.

In an effort to see what effect lower air freight rates and consequent air transportation of feeders and calves to the U.S. Mainland will have on ranch income in Hawaii, a set of budgets for a hypothetical ranch containing 18,500 acres of pasture were developed. These budgets were based on previous survey results developed to determine ranching practices in Hawaii,[1] and on consultation with other University personnel and ranching experts.

With 62.3 per cent of the total beef production of the State located on the island of Hawaii, this island was chosen as the location of the hypothetical ranch. Trying to determine input-output data for a typical or average ranch would be difficult due to the variation in management practices. Therefore, a large commercial ranch was synthesized.

All costs included in this study provide an equitable comparison of the alternative methods of beef production. Since ranchers in Hawaii do not always consider all costs when choosing among alternative methods or practices, opportunity costs for both land and cattle investment are ignored.

The hypothetical ranch is located in the Northwest part of the island of Hawaii. It contains 18,500 acres of pasture land, located in various rainfall zones and elevation levels. The best pasture has a carrying capacity of one animal unit per two acres, and the lowest yield land will support one animal unit on fifteen acres. The overall average for the total 18,500 acres is one animal unit per four acres. The pasture has been improved and is maintained by a system of pasture rotation which is regulated according to rainfall conditions.

The hypothetical ranch will be set up under two livestock systems. The cow-calf livestock system as defined in this study is the maintenance of brood cows the year around for the purpose of producing calves. The calves are weaned at eight months of age and weigh approximately 400 pounds when they are separated from their mothers. The ration for these calves consists of milk from their mothers and some supplemental grazing. Under the cow-calf system, the pasture land available on the ranch will support 4,884 animal units. The breeding herd consists of 2,800 cows and 210 bulls. The hypothetical ranch carries on a

breeding program so that calves are dropped four times a year, with each breeding herd consisting of 700 cows and 50 bulls.

The second livestock system is a cow-yearling operation. Calves are weaned at the same time as under the cow-calf system, but they are then pastured for a period of from six to eight months. The ration for these yearlings consists of pasture plus supplemental feed of 15 pounds of urea and 840 pounds of molasses per head. Under the cow-yearling system, the pasture available on the hypothetical ranch will support 4,860 animal units with the breeding herd consisting of 2,200 cows and 160 bulls. In order to draw conclusions from a comparison of livestock systems, both systems used in this analysis are of the same size.

One major problem in the air transportation of feeder cattle to the Mainland is the space requirement and location of empty containers. Empty livestock containers would be moving from the Mainland to Hawaii, the same direction as the bulk of the merchandise. To solve this problem, livestock containers must either be usable for other merchandise, or be clean and collapsible to permit their movement with other merchandise.

A new multi-animal, reusable and collapsible "Livestock Transport Carrier"[2] was designed to provide a lightweight and easily stored container to transport various classes and weights of livestock by air. This air inflatable container weighs approximately 300 pounds empty and it is estimated that the maximum loading weight will be 8,000 pounds.

This unit is designed to be inflated and pre-loaded at the shipping point (e.g. at the ranch in Hawaii) to be transported to the airport on a flat bed truck. There the containers are moved on rollers directly into the aircraft. Upon arrival on the Mainland, the process is reversed and the containers are unloaded at the feedlot. Prior to their return shipment to Hawaii they will need to be cleaned, deflated, and collapsed. The container will collapse to a height of 5" which permits eight units to be stacked for return shipment. This intermodel aspect of the container may allow the carriers to reduce handling time and transportation costs.

RANCH INCOME DERIVED FROM MARKETING ALTERNATIVES IN HAWAII AND ON THE MAINLAND USING VARIOUS OPERATING SYSTEMS.

The total annual costs and returns for the hypothetical ranch were budgeted from the production and marketing of 1,400 fed yearlings in Hawaii. Total Cash costs are $387,728.02. Of this total, the costs of finishing and marketing amount to $227,794.00, or 58.75 per cent. The next largest cost is hired labor and management. This amounts to $63,920.00 which is 16.48 per cent of the total cash costs. Non-cash costs covering such items as cow replacement, cow breeding, and depreciation is $35,902.20. The cow replacement costs are based on a cull rate of 14 percent and a 1 per cent death loss. Total annual costs for the hypothetical ranch operating under the cow-yearling system are $423,630.32.

With a cull rate of 14 per cent, 308 cull cows are marketed each year. Total gross returns from their sale are $56,918.40. Heifer replacements are chosen early so the cull heifers are young enough to enter the feedlot with the balance of the yearlings, thus they maintain their value as feeder stock. There are 40 cull heifers that are placed with the yearlings which enables the ranch to finish and market 1,400 yearlings.

Total gross returns from the sale of 1,400 fed yearlings are $401,016.00. Adding the gross returns from cull cows results in total gross annual returns to the hypothetical ranch of $457,934.40. Deducting total costs of $423,630.32 leaves total annual net ranch income of $34,304.00, or $24.50 per fed yearling.

The total annual costs and returns budget of the hypothetical ranch operating under the cow-yearling system with the stock being finished and marketed in Ventura, California shows total cash costs are $375,249.12 which is $12,194.00 less than the same operation in Hawaii. This decrease in costs is due to

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the lower price of feed on the Mainland. Gross returns to the hypothetical ranch for 1,400 finished yearlings are $373,800.00. Due to the price differential between Hawaii and the Mainland, this is $27,216.00 less than these animals could be sold for in Hawaii. With the air freight rate at $.10 per pound, total net ranch income is $19,567.08. Thus, finishing and marketing in Hawaii will increase net ranch income by $1.05 per animal.

For every one cent decrease in the air freight rate, net ranch income will increase $8,400.00 assuming all other costs and returns remain constant. When the air freight rate declines to $.08 per pound, the finishing and marketing of 1,400 yearlings in Ventura, California will increase total net ranch income by $3,063.08. The breakeven point between Hawaii and the Mainland for these two finishing and marketing systems is approximately 8.25 cents per pound.

An alternative to the fed yearling operation in Hawaii is the finishing and marketing of calves on the Mainland. This would involve shipping calves to Los Angeles as soon as they are weaned. Upon their arrival at the feedlot in Ventura, California, they would be placed on a growing ration for approximately 150 days and then gradually shifted to a finishing ration during the final 90 days of their feeding program. During this total feeding program, these calves can be expected to average 2.5 pounds of gain per day with a 7/1 feed to beef conversion ratio.

When the resources of the hypothetical ranch are allocated to cow-yearling production, there are 2,200 cows in the breeding herd. With an 80 per cent calf crop at weaning, 1,760 calves will be weaned. Of this number, 360 calves will be needed for cow and bull replacements. Therefore, 1,400 calves are available to be marketed. If the manager of the hypothetical ranch decides to place these calves on the Mainland market, some of the ranch resources will become idle. Labor costs to ship 1,400 calves to the Mainland will be reduced by $7,488.00 because 15 per cent of the hired labor is used in the maintenance of yearlings. On-ranch feed costs were reduced by $18,484.50, because the supplemental feed purchased for the yearling herd was not needed. Total costs are $410,623.27. Gross returns from the sale of 308 cull cows and 1,400 fed calves are $430,718.40.

Total net ranch income from this activity is $19,575.66. If calves were air freighted to the Mainland at a cost of $.10 per pound, instead of growing them to yearlings and finishing them in Honolulu, net ranch income would decrease by $14,728.34. When the air freight rate goes down to $.07 per pound, by allowing some of the ranch resources to remain idle, and by shipping the total calf output to the Mainland, net ranch income can be increased by $2,071.66.

When the resources of the hypothetical ranch are fully employed, the breeding herd would consist of 2,800 cows. The total annual calf crop would be 2,200, of which 1,700 could be marketed. With the increase in the number of calves produced, two additional employees would be required and total costs for hired labor and management would be $72,240.00. Total cash costs for the shipment of 1,700 calves to Ventura, California are $448,220.16 non-cash costs are $41,686.80. Gross returns are $526,341.60. When all costs are deducted, net ranch income is $36,434.64 estimating air freight rate at $.10 per pound. This is $2,130.64 more than the marketing of 1,400 fed yearlings in Hawaii. With a decrease of $.01 per pound, net ranch income will increase by $6,800.00, therefore, at $.09 per pound of air freight, shipment of 1,700 calves to be finished in Ventura will increase net ranch income by $8,930.64 over the amount obtainable from the production and marketing of 1,400 fed yearlings in Hawaii. When the air freight rate reaches $.06 per pound, the market returns of 1,700 calves will be $29,330.64 greater than 1,400 fed yearlings in Hawaii.

Another decision for the manager of the hypothetical ranch would involve the finishing and marketing of calves not expected to grade choice. In Hawaii, there is a $4.00 per hundred (dressed weight) price differential between choice and good. On the Mainland this differential is only $1.00 per hundred liveweight. The fed stock of the hypothetical ranch is assumed to grade 70 per cent choice and 30 per cent good. Most ranch managers and owners indicated they were able to ascertain at weaning which calves would not finish high enough to grade choice. The costs and returns were estimated for the hypothetical ranch if 30 per cent (420) calves were sent to the

Figure 1.

**Breakeven Points of Net Ranch Income from the Different Operating
Systems of the Hypothetical Ranch**

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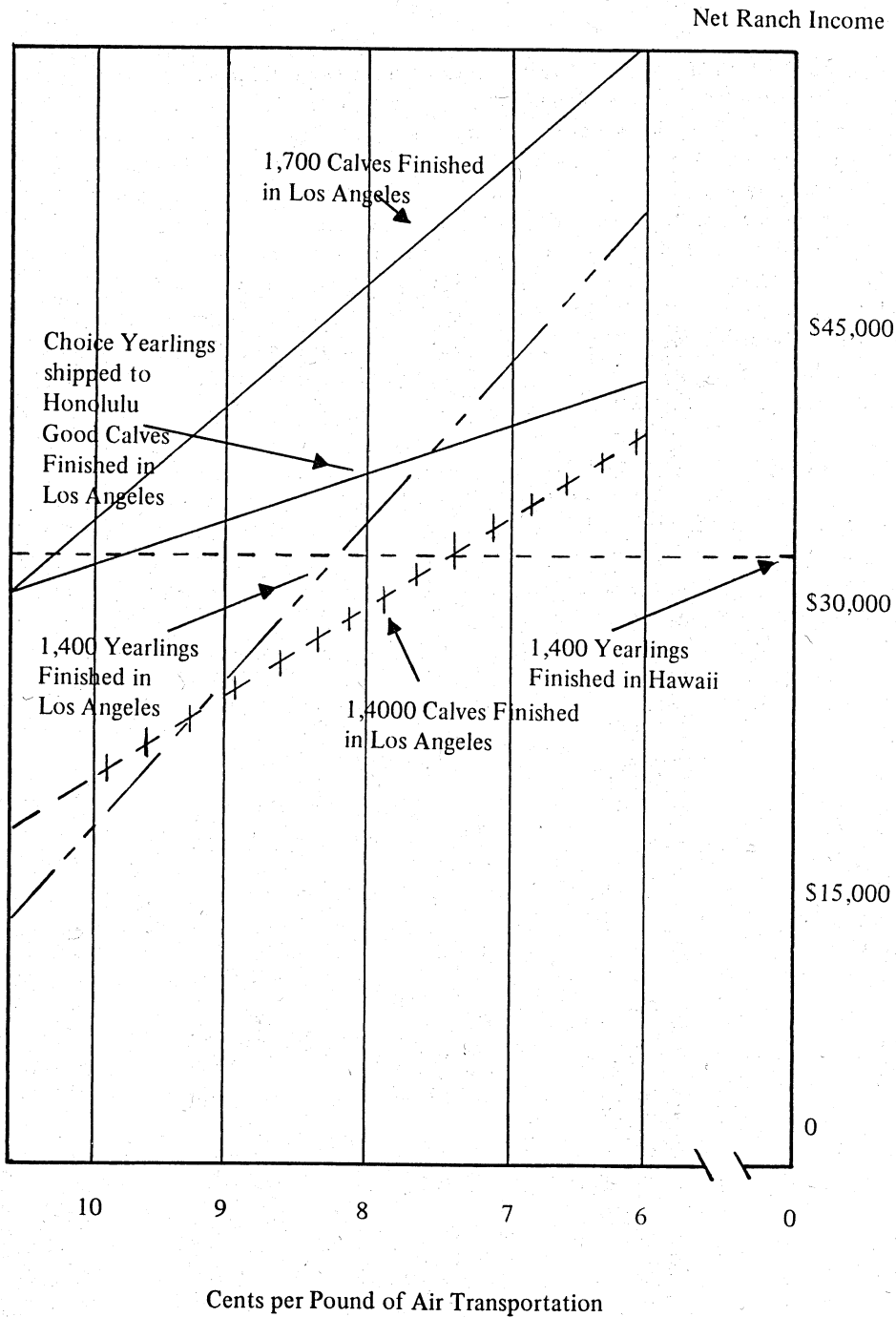
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Net Ranch Income

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Choice Yearlings
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1,400 Yearlings
Finished in
Los Angeles

1,4000 Calves Finished
in Los Angeles

1,400 Yearlings
Finished in Hawaii

$15,000

0

10   9   8   7   6   0

Cents per Pound of Air Transportation

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Mainland, finished in the Ventura, California feedlot, and sold to grade good. Gross returns per animal would be $267.00. The balance of the herd would be placed on growing pasture, provided with the necessary supplemental feed, and later finished in the feedlot in Honolulu. Under this arrangement, with the air freight rate at $.10 per pound, total net ranch income would be $32,916.34. The breakeven point for this alternative is between $.10 and $.09 per pound. Lower air freight rates will not have the same effect as some previous marketing systems due to the number of animals moving to the Mainland, in this case only 420. A one cent decrease in the air freight rate will only increase net ranch income by $1,680.00. Some of the resources of the hypothetical ranch will not be used. To maintain the ranch at complete utilization of all resources, the pasture previously allocated to the 420 calves shipped to the Mainland will have to be stocked with yearlings or brood cows. No estimate for adjustment in herd size of this nature was made.

During the course of this analysis of the hypothetical ranch, five basic production and marketing systems were reviewed. Figure 1 contains the net ranch income estimates with the air freight rates on a back haul basis to the Mainland between $.10 and $.06 per pound. Again the system used as a basis for comparison is the marketing of 1,400 yearlings in Honolulu. Total net ranch income from this operation is $34,304.00. This is not the most profitable method of operation when the air freight rate to the Mainland is $.10 per pound. At a price of $.10 per pound, one operating system will increase net ranch income. Converting the resources of the ranch to a cow-calf system and the production, finishing and marketing of 1,700 calves on the Mainland will increase net ranch income to $36,434.64 or an increase of 10.62 per cent. At $.09 per pound, the marketing of choice yearlings in Hawaii and good grade calves on the Mainland will increase net ranch income by $292.34 or approximately one per cent. When the air freight rate declines to $.08 per pound, the marketing of 1,400 yearlings on the Mainland will increase net ranch income by $2,063.08 or 6.00 per cent. When the air freight rate declines to $.07 per pound, all operating systems entailing shipment of stock to the Mainland will increase net ranch income.

The most profitable system is the cow-calf operation. Some ranchers in Hawaii are forced to either place calves on growing pasture which is rented from others, or begin dry lot feeding soon after they are weaned because their ranches are located in high rainfall zones. In these areas, young calves are not able to consume enough of the high moisture forage to permit adequate growth. Provided their costs are similar to those estimated for the hypothetical ranch, a new marketing alternative might be available. These ranches are not located on the islands of Hawaii or Oahu, therefore, the additional cost of transportation to either Honolulu or Hilo must be included when estimating their net ranch income. Some ranchers feed groups of cattle in Honolulu which grade below the 70 per cent choice and 30 per cent good estimated in this analysis. These ranchers may be able to increase their net ranch income by being able to take advantage of the lower price differential between choice and good grade found on the Mainland.

FOOTNOTES

1. Jenkins, G. M., et. al., *An Analysis of Ranching Practices in Hawaii,* Hawaii Agricultural Experiment Station Research Report No. 174, In Print.

2. Designed and patented on the Mainland by Mr. James W. Storey of Spring Valley, California.