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THE CATTLE INDUSTRY OF BELIZE



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One of Belize's greatest agricultural assets is its incredible potential for a thriving cattle industry. This paper will deal with the history, present status and future potential for development of this industry.

The development of a cattle industry in any area, temperate or tropical, historically has occurred in three progressively complex steps of usage. These three uses are work, meat, and milk. Each step requires a more intense application of the principles of herdsmanhip and animal husbandry, and a more intensive incorporation of all resources to achieve an ever increasing level of production per animal, per laborer and per unit of land. The pattern of development in Belize follows these three steps.

CATTLE AS DRAFT ANIMALS

Until about 1910 cattle in Belize were primarily used as draft animals, especially for logging. Meat production was only incidental to work, and milk production was very minimal. Management was extensive; a free-range system of grazing from unimproved pastures supplied the

greatest part of feed in the animals' diet. There was little or no selection to improve type. Native cattle (Creol cattle) were a mixture of various breeds from the Taurine line (9). They were the remnants of some of the original cattle brought to the Americas by Spanish settlers (9; 11). Their acclimatization and disease tolerance were excellent but their type and structure were extremely poor. In an effort to improve the quality of work animals Zebu or Bramah types were introduced around 1900 (3; 8).

Beginning about 1910 breeds of the Bos taurus species were imported including Guernsey, Holstein, Jersey, Aberdeen Angus, Red Polled and Hereford in an effort to upgrade the quality of local Creol cattle by cross breeding. Around 1920 a major shift in emphasis occurred when beef breeding began to receive important considerations.

Most of this early improvement was undertaken as an enterprise of the private sector of the population. By 1946 there were 10,130 cattle in Belize, of which half were in the Cayo District. However, by this time the major emphasis had changed from draft to meat as 95% of the entire cattle population was composed of beef animals (8). Management, however, was still very extensive; that is the development and use of pastures was minimal and selection methods were poor. Nutritive requirements were supplied almost exclusively through local pastures which were unimproved and overgrazed. The body of knowledge regarding selection for desirable type, disease and insect control, and general management was small.

DEVELOPMENT: ECONOMIC, SOCIAL AND EDUCATIONAL FACTORS

Interest arose around ¹⁹⁵⁰ 1960 in developing a more intensive (maximizing production) beef in-

dustry. A major economic reason for this was that local demands for meat were not being met. Moreover, foreign investors had expressed interest in developing cattle operations in Belize, since foreign markets in the Caribbean and Central America were available and were unfilled. Government took a more active role in encouraging greater efficiency in production of foodstuffs to meet internal demands and to supply foreign markets. The 1953 Land Use Survey further encouraged investment and development of cattle operations by showing that vast areas of Belize were highly suited to range-cattle production (semi-intensive) and that native pastures could furnish excellent feed if managed properly.

Among the better educational and sociological factors which were to encourage the growth of more intensive range-cattle operations were the establishment of government beef and dairy herds in 1951, thus creating research and extension facilities to test new techniques in cattle production and to distribute these techniques to farmers. Government also undertook a policy to encourage small family-farm herds defined as having 100 cattle or less. Major reasons for this policy seemed to be to encourage small farmers with relatively little capital to get involved in cattle operations. In this way a small animal to man ratio (40 to 50 cattle per farm laborer) would encourage more attention to each animal and thus more intensive production per animal. Hopefully this "family farm policy" would encourage all sectors of the population to get involved and would be more efficient than a few large producers having vast herds and large animal to man ratios (500 to 1000 cattle per laborer) where individual attention to each animal might be lacking. Implementation of this policy was brought about by maintaining a cheap land policy where anyone with the desire could obtain virgin land and develop it for agriculture. Government also

established a machine pool where small farmers could hire land clearing equipment at reasonable rates to develop their new land. This would save small settlers a large permanent capital investment in machinery which might be used only one time (1; 2; 3).

To satisfy local and foreign markets for beef, quality cattle were needed, cattle at least of better quality than the native Creol animals. This quality could be achieved in two ways. First importation and establishment of purebred beef herds could be undertaken. This would require large capital investment. It would also require an excellent knowledge on the part of each producer of intensive cattle management techniques in order to maximize production from these purebreds. Potential local producers, especially small ones, had neither the capital nor the knowledge of modern production techniques.

A second method was possible; that is, upgrading, crossbreeding local cattle to imported beef sires of desirable type. Through this upgrading plan the improvement of livestock and the education of farmers in husbandry and management could occur simultaneously. It was the job of the Agricultural Extension Department to implement this plan. Creol cattle provided the necessary climate and disease tolerance while purebred stock (Bramah, Santa Gertrudis, Hereford, Red Polled, etc.) imparted good confirmation and type. Hopefully as farmers gradually learned better management methods and increased their capital investment, the pedigree of their overall herds would improve. The percent of Creol blood in the cattle population would decrease while the percent of improved blood from purebred stock would increase.

This method of improving the national cattle herd would be more gradual than would be the first. But through it small farmers could be



Creol cattle (above) are descendants of those originally brought to the Americas by early Spanish settlers. They have good heat tolerance but poor feed efficiency. Improved breeds like the Santa Gertrudis (below) have excellent heat tolerance and surpass Creol cattle in converting feed to meat more efficiently.



educated in new selection and management techniques. Use would be made of the national Creol herd and a solid basis to good meat production would be established.

The excellent educational system existing in the country served to predispose new producers to the educational (extension) method of building the cattle industry, if only by the fact that farmers newly embarking upon cattle production were able to read and write and thus take advantage of extension programs.

Still another economic factor, although a questionable one, which exerted an impact on cow herds was a policy begun in 1951 controlling the slaughter of all female stock. This policy conceivably kept some very undesirable females as breeding stock long after they should have been slaughtered. Its major advantage was probably an educational one in serving to emphasize the importance of numerous females bred by a relatively small number of desirable bulls for producing quality calves.

A major social asset was the impact of foreign or immigrated communities living in Belize. Peoples from the United States, the United Kingdom, the Commonwealth and various areas of Central and South America have made great contributions, primarily in applying and refining previously acquired skills in breeding, feeding, selection and management, and showing how these skills can bring success in Belize. The Mennonite communities have been especially responsible for establishing and showing the suitability of this country for dairy cattle. Their family and religious units emphasize the feasibility of family farm operations.

A major economic and social function of cattle in helping develop a sedentary agricultural system is that they fit well into rotational

or simultaneous multi-crop schemes that predominate after milpa or shifting agricultural systems decline. In order to allow some fallow and regeneration of fertility in the soil, pastures (grasses and legumes) may be introduced into the crop or crop rotation systems. Ruminants (in this case cattle) are an excellent way of obtaining an economic return from pastures while the land is in this stage of the rotational cycle.

PHYSICAL ASSETS OF BELIZE

Belize also has geographical, climatological and geologic advantages which encourage cattle production. Many of the soils, especially in the northwest, are fertile alkaline (basic) clays which support good forages necessary for raising cattle under semi-intensive range conditions. Native pastures of St. Augustine grass and legumes of the *Desmodium* and *Vigna* species occur naturally, especially on alluvial soils (6;8). These can provide good pasturage during much of the year.

Other soils occurring in the savanna or natural grass and sedge areas of Belize are light and poor in available minerals. This is especially true of soils at certain higher altitude areas like the Mountain Pine Ridge. These cannot support any kind of intensive crop agriculture because of their physical structure, which is very open to erosion, and because of the incredible amounts of fertilizer necessary to support good crops. They could however lend themselves well to semi-intensive range-cattle production if planted to desirable grasses and legumes, if fertilized minimally and if rotationally grazed.

The climate, seasonally moist tropical and subtropical with rainfalls varying from 35-180 inches throughout the country, although erratic,

is conducive to good pasture growth over most of the year.

GROWTH OF THE INDUSTRY

The assets and policies described herein have had their impact on the industry at various times in the past 30 years. Surveying the growth in the cattle industry (Table I) since 1946 one can find at least three periods when the cattle population had a major percentage increase. These were the 10-year periods from 1946 to 1955, from 1955 to 1965, and the 7-year period from 1968 to 1975.

TABLE I

Cattle Numbers

<u>Year</u>	<u>Number of Animals</u>
1946	10,130
1955	15,644
1965	33,000
1966	36,000
1968	29,021
1969	30,274
1970	38,300
1975	45,000
1976	42,000 (est.)

The first 10-year period 1946 to 1955 witnessed a rise in cattle numbers of over 50% from 10,130 to 15,644 (3;8). The major factors responsible for this seem to be at least two: the 1951 control order limiting slaughter of female stock, and the establishment around 1951 of the government beef and dairy research herds, plus an extension system to distribute research findings to farmers.

The second major increase from 1955 to 1965

saw the cattle population rise by over 100% from 15,644 to some 33,000 (3;4). The major reason for this increase seems to be continuation of the cheap land policy encouraging permanent settlement of new lands as opposed to milpa or shifting agricultural systems. Also at this time the effects of the 1953 Land Use Survey were beginning to have a great impact on publicizing the suitability of much of Belize for range-cattle operations.

From 1966 to 1968 cattle numbers declined by over 19% from 36,000 to about 29,000 (5;6). Reasons seem to be a poor marketing system and low prices for live cattle. Also, overstocking of many pastures caused a semi-starvation of much of the stock when the dry season came. However, from 1968 to 1975 the population again saw a sharp increase of over 55% from 29,000 to 45,000 (6; 7). This seems to be due especially to the establishment of better marketing facilities in Belize City and auction markets in various districts (7). During this period there was a general shift in the world market from demanding well finished or "grain fed" beef to demanding lean or "grass fattened" beef.

It is of interest to note that average dressing weights have increased by 50 pounds over the last 25 years (Table II). In the years 1951 to 1965 weights of dressed beef carcasses usually were in the range of 200 to 250 pounds (4;5). Assuming a 50% dressing rate for beef carcasses, this indicates that cattle were being slaughtered at weights of 400 to 500 pounds. But from 1969 to 1975 average dressing weights increased and generally ranged between 300 and 350 pounds (1;2; 6;7). This indicates that cattle were being slaughtered at weights of 600 to 700 pounds.

The overall increase in dressing weights indicates that cattlemen have adopted certain tech-

TABLE II

Slaughter Statistics for Cattle

<u>Year</u>	<u>No. Slaughtered</u>	<u>Dressing Wt.(lbs.)</u>	<u>Average</u>
1951	3226	811,326	251
1952	3074	722,023	234
1953	3250	698,324	214
1965	4231	1,053,519	249
1966	4578	1,153,656	252
1968	----	1,304,856	---
1969	3081	960,650	312
1970	3310	1,045,517	316
1975 (est.)	5800	1,798,000	310

nology. that has improved their herds. My discussions with various producers large and small around the country lead me to believe that the most successful policies have been the breed importation and research program, and the extension system encouraging upgrading of local Creol cattle by making proven quality breeding stock available to farmers at reasonable prices. Cattle will continue to improve in pedigree.

To a lesser extent pasture improvement and the treatment of pastures as an important crop has had some positive effect on cattle quality and size. But small farmers still seem to think of pasture as a secondary growth which requires little or no investment or management. A very important factor inhibiting development of much of the range land is that it is open range. No one farmer has title to it. Therefore individual producers who may be aware of the advantages of improved pastures may be unwilling to invest in land to which they have no title. Improved pastures and pasture management is and will continue to be the domain of producers who hold title to their land and thus wish to improve it and intensify their production per acre.

As one surveys the growth of the cattle population, a comparison of herd sizes and numbers is of value. For the period 1955 to 1970 there was a rise in the number of herds in the country by 722 (3; 7). The number of producers rose from 600 to 1322 (for purposes of comparison we assume one owner or one company ownership of each herd) or an average of 48 per year. During this same period the average herd size rose by 3 from 26 animals in 1955 to 29 in 1970 (Table III). This average is well within the definition of a small herd as having 100 or fewer animals (6). In 1969 a government survey found that half of all cattle were in small herds while half were in medium (101-1,000 animals) or large herds (over 1,000 animals) (6). This same survey found that most growth in cattle numbers was occurring in medium and large herds.

TABLE III
Average Herd Size

<u>District</u>	<u>1955</u>	<u>1970</u>
Belize	18.66	29.15
Cayo	40.00	64.26
Corozal	8.30	11.23
Orange Walk	28.45	11.60
Stann Creek	20.04	27.15
Toledo	15.75	15.60
Nation	26.07	29.03

PROBLEMS AND OBSTACLES

The picture given thus far is one of general optimism. But major problems remain to be solved. The greatest of these is the obstacle of an erratic annual dry season (drier in some years than in others). When the dry season begins, pastures, especially unimproved ones, dry up. In

the absence of supplemental feeding livestock begin to starve and lose weight. Improved pastures planted to drouth tolerant grasses and legumes can alleviate this problem somewhat but a supplemental feed crop is the only way to insure continued growth of cattle during this dry period.

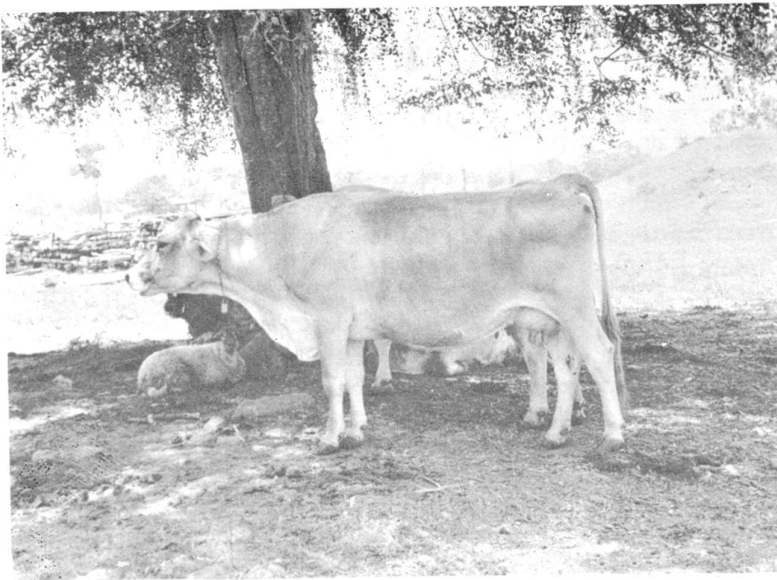
Unfortunately, most producers, especially small ones, have not accepted the idea of raising and preserving a crop to be fed to animals. Their main use of any cultivated crop is for human consumption. Yet soiling grasses like corn, sorghum, Merker and Guinea grass put on lush growth during most of the year and can be cut and preserved inexpensively (usually as silage) for feed during the dry season. The most successful producers follow this principle. It is the key to improving beef quality, even more important than planting improved pastures.

The pressing need for supplemental feeding was especially emphasized by the long 1975 drouth when the entire 45,000 cow national herd lost an average of 50 pounds each or a gross of 2,250,000 pounds valued at \$ 3 million (2). Presently farmers generally market their animals at 500 to 700 pounds live weight either before or after the dry season takes its toll. At these weights cattle are too young and the meat from them will not even grade "good". They should be kept to 900 to 1000 pounds. But adaptation of this idea of raising and feeding supplemental feed requires education and resocialization of farmers to the idea of raising a crop for their animals. Unless this key principle is adapted Belize may find the foreign demand for its cattle declining as its grade of meat does not satisfy foreign markets.

Closely tied to the problem of instituting supplemental feeding is the problem of marketing. Although the marketing system has improved over the past 30 years, it is still lacking. Larger

producers may slaughter and market their own beef but small producers are in no way able to do this and they suffer most. The market has no system of grading beef. A live-grade system, if instituted, would encourage producers to raise animals to a quality grade for which a better price would be paid. The control price also tends to be low and does not encourage producers to strive for higher quality.

Third among the major problems facing most producers is the incidence of internal parasites. The country is fortunate in not having a serious problem with contagious diseases such as Rinderpest, Brucellosis, Anaplasmosis, Aftosa hoof and mouth, etc.; but losses due to internal worms and



Common dairy breeds like the Brown Swiss above show promise of adapting well in Belize. Presently dairy cows produce 6000-7000 pounds of milk annually on feeds composed almost entirely of grasses and legumes.

flukes are great. The remedy is fairly simple. Producers need only administer oral drugs and chemicals (drenching) to avoid these losses.

CONCLUSIONS AND FUTURE PROSPECTS

This paper has tried to show that important changes in cattle numbers over the past 30 years have been the result of policies both public and private, aimed at implementing the use of existing resources and the adaptation of new technology, i.e. the 1953 Land Use Survey, the cheap land settlement policy, the establishment of a research and extension system, introduction of new breeds, etc. This recognition and implementation of resources was not always easy. Response of different segments of the national community could not always be anticipated. But the risks were taken. In some cases they failed, but in many they succeeded. The present cattle population stands at about 42,000. This total can again expand to 65,000 or 75,000 within the next 3 or 4 years if certain points are recognized upon which the economy of this industry is based. New producers should continue to be encouraged to enter the industry on a small and medium size scale.

But along with this, encouragement should be given to maximizing efficiency of production units (individual farms). This may necessitate a redefinition of social and economic terms in regard to resources in Belize. The definition of a small beef herd as having 100 or fewer animals seems suitable. But the definition of medium size beef herds may have to be expanded to include herds ranging in size from 101 to 2, 3, or 4 thousand animals. This is especially due to the fact that family farms and ranches whose main income comes from beef cattle tend to adapt and apply new technology very readily and thus inten-

sify production per unit of land, worker and animal without improper exploitation of labor or natural resources. The definitions would of course differ between beef and dairy operations.

The most efficient use of resources tends to occur on the medium size family farms. Therefore the greatest hope for intensive (maximal) production per unit of resource in Belize lies in encouraging growth of operations to this medium size. This increased production per unit resource has hardly begun to be developed in Belize. One producer of medium size (1000-1200 head) informed me that his processing unit could handle eight times its present daily output of beef with very little additional capital investment. He would still remain a medium producer. But fears of his overexpanding prompted the government to deny him permission for this expansion, which would have gone far in supplying a "good" grade of beef in his area.

Producers with the desire to adopt methods that intensify their production per animal, per land unit and per worker should not be penalized for their initiative. Policy of limiting farm and ranch size should not be based only on numbers and size of landholding. Consideration must also be taken of the producer's desire and ability to manage for maximum output of meat or milk.

As herdsmanhip improves Belize will see a growth of the third and most intensive level of cattle production, dairying. Cattle convert feed to milk far more efficiently than they convert it to meat (11). Part of this growth of dairying will be facilitated by the small and medium family herds. These encourage the high degree of individual attention necessary for each animal in a dairy herd. Most of this growth will depend on a highly developed extension system to dis-

seminate new techniques which will encourage this very intensive level of animal production.

The key to future growth of the cattle industry in Belize lies in the continued gross expansion combined with a greater efficiency of production per unit of land and per animal. But increased efficiency will be very slow because this industry will continue to be based on a semi-intensive range system of grass fed and grass fattened animals. Generally, one can say that many of the feeding and parasite problems discussed herein will decline and the quality of cattle will increase as the open range system of production declines and as individual title holdings increase. Then individual producers will have an incentive to plant improved pastures, to rotationally graze these pastures, to plant supplemental forages for the dry season, and to collect their animals on some regular basis to vaccinate and drench them against diseases and parasites. The open range system which now predominates over many savanna or natural grass and sedge areas of Belize will give way very slowly to titled landholdings over the next 20 to 40 years.

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