

FINAL REPORT

Quality Aysen Patagonia Beef from Chile

Overview of Harvest and Processing Plant Potential:

A stand-alone beef processing plant in the Aysen region has several challenges due to logistics, local knowledge of beef processing and marketing, and water being a limiting resource. However, with appropriate planning and the development of a multi-ownership business, there is the potential for success, and it could be an economic driver for the use of greater technology by small farmers in the area.

The major obstacle is that most beef processing facilities take advantage of byproducts being a significant source of revenue. In this region, the logistics of supplying a sufficient quantity of the various byproducts in a timely manner to make shipping byproducts financially feasible presents obstacles. This issue could be minimized if the structural framework for a partnership with the salmon industry were developed. *I would recommend that Dongnam Oil and Fats Co. Ltd http://www.dnof.com/company/ceo_e.php, or a similar company, which specializes in the production, sales, and distribution of animal and fish fat and oil would be an exceptional partner. This would result in the separation of the substantial amount of waste fat from intestinal contents, and would provide an additional source of revenue to the venture.*

The issue of waste products from a processing plant focusing on ruminants cannot ignore the large amount of intestinal tract contents. I would recommend that equipment be installed to press the contents to remove as much liquid as possible. This would result in a large quantity of contents, primarily derived from forage. *This could lead to the development of a composting company that would be able to spread the composted product for soil amendment, or for fertilizer for other vegetable product industries in the area, or the rumen contents could flow to an on-site anaerobic digester that would produce some of the plant's energy. The byproduct of this process has had most of the cellulose and hemicellulose digested, and is used in the U.S. for bedding by dairies that have anaerobic digesters.* In addition, the byproduct could be used as an addition to soil in a greenhouse industry, as it leaves the process with very few pathogens.

The issue of water is critical. Meat processing plants require significant quantities of water. I would recommend that water be purified and re-used. A processing facility takes a lot of water. In order to be sustainable, and have as little environmental impact as possible. Here are examples of companies that specialize in this technology. I found these with a Google search, and this is not an endorsement, but given to show that this type of technology is available, today: <http://appliedmembranes.com/water-treatment-systems.html> and <http://www.lenntech.com/>. I believe that every effort must be taken to assure that the Aysen Region of the Chilean Patagonia remain a natural treasure to the world.



In addition to the need for a rendering industry, I see an opportunity for leather tanning and leather craft. This could be a new industry for the area where local artisans used the tanned hides for art such as wall coverings with tooling, wallets, clothing, briefcases, travel cases, purses, and other items made from leather. If you do a Google search for 'leather art' you can see hundreds of options. If there is a technical school in the area that could teach courses in this area, it could create options for people to have income with a business that they could run from their homes.

Marketing:

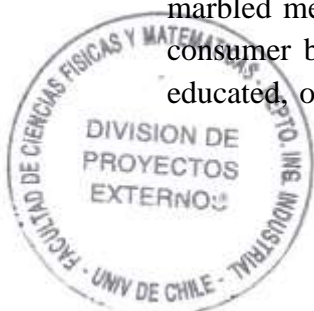
Will the beef processing facility operate 12 months out of the year? This is critical, as the production of cattle out of the 'normal' Aysen production calendar will be critical for the plant to succeed. This will require greater education, on-farm assessment and instruction, field-days demonstrating technology to small-scale farmers that have been adopted by other small-scale farmers in the area.

The major positive from this project is the natural, 'unspoiled' beauty of the Aysen region. This creates a nearly perfect marketing opportunity. However, it places a tremendous amount of pressure on the operation to assure that it is, in fact, an environmentally conscious project. The closed-loop structure would be a benefit to the marketing effort.

The major obstacle to marketing is the tremendous amount of emphasis that consumers from the E. U. and the U. S. place on animal welfare, and the specific cuts of meat that are defined in the U. S., which are standard across the industry. *I believe that identifying a processing plant partner with experience in cattle harvest, processing, selling byproducts, and marketing boxed case ready products to the U. S. will be essential to the success of this project.*

The image of the Chilean baqueano or huaso is one of a person who is independent, skilled with horses, and adaptable to harsh environments. However, *the traditional ways that these people work cattle is not compatible with the humane standards that are in place in the U. S. or the E. U.*, where increasing emphasis is being placed on corral and working facilities meeting current standards, and the movement to requiring anesthesia prior to castration or dehorning. These production practices can either be a positive, or a negative in marketing.

The marketing of all-natural from animals raised with grass is not unique. The major limitation with most 'grass-fed' cattle is that the products are sold as ground beef, which is a low profit business. The program will have a much greater opportunity for success if the focus is on highly-marbled meat products from grass-fed beef. This is not easy, but it is unique. The most likely consumer base for these products are higher-income households. These consumers are highly educated, on the average, and tend to live on the east coast or west coast of the United States.



The Aysen region already is known to the hiking and fly fishing enthusiasts in the western U. S., and this region seems like the most likely group to have an immediate positive reaction to the Aysen region of Patagonia Chile.

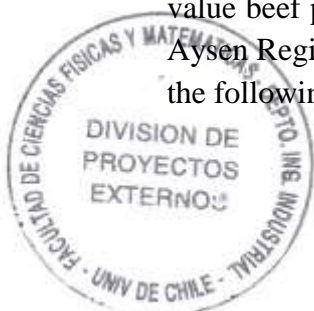
Baby Beef does not look like a viable option. Processing facilities need to produce pounds. It takes the same amount of labor, time, and chill cooler rail space for smaller carcasses as it does for larger carcasses. Therefore, every animal destined for the ‘Baby Beef’ market is less economical for the plant than a larger carcass. In addition, I have conducted research with cattle harvested after weaning at 9 to 10 months of age. The consumer taste panel that compared this product to grass-fed beef or grain-fed beef found it to be the least acceptable. They described it as ‘mushy’, and ‘mealy’ these terms translate to a very soft product that broke apart and seemed dry when being chewed. It resembles veal, and outside of some very specific market areas in the U.S. where veal is consumed, such as New York and possible south Florida, I do not see a market for this product.

The sale of meat products to the U.S. demands conformation to the Institutional Meat Purchase Specifications (IMPS)
http://www.ams.usda.gov/sites/default/files/media/IMPS_100_Fresh_Beef%5B1%5D.pdf and will require working with a processing partner with a great deal of international meat merchandising.

Production:

Working with larger farmers who put up silage and small grains will be critical to success. However, *as in the U.S., innovative larger-scale producers will take advantage of the lack of marketing knowledge that small-scale farmers have.* In every part of the world, producers have the majority of their calves in the spring, and sell the majority of their calves 6 to 8 months later. This drives the price of cattle down, and is the economic model that larger-scale cattle feeders rely on. In some ways, while the processing plant will provide an outlet for selling cattle that are market ready, which will be seen as a positive by larger producers, the educational efforts that add value to the cattle produced by smaller-scale farmers will be seen as a negative, potentially, by larger-scale farmers. The key to alleviating this potential obstacle is to be clear and consistent in the message that educational efforts are aimed at improving cattle reproduction and genetics, which increases the number and quality of calves available for purchase, and improving knowledge about animal welfare, and maintaining water areas that flow through farms.

The production of beef animals meeting the demands of consumers desiring a high perceived value beef product will require several structural changes in the beef production practices in the Aysen Region. The production of high-quality beef for the all-natural market involves addressing the following areas:



- Breed Selection
- Timed Breeding and Cow Herd Management
- Forage Testing and Management
- Weaning and Cattle Handling Methods that Reduce Stress
- Finishing on Highly Digestible, High Protein Forage

Breed Selection:

The two breeds with the potential to create a more highly marbled beef product from animals raised on grass are Angus and Wagyu. Within the Wagyu breed, I would recommend looking to Red Wagyu developed in Australia, as these were developed to marble on grass. The Red Wagyu tend to be more heavily muscled than Black Wagyu, with slightly less marbling potential. The Angus breed in the U. S. has highly accurate genetic tools such as Expected Progeny Differences that can make the development of animals with high marbling ability relatively easy. *The use of artificial insemination with selected bulls in these two breeds will save decades compared with using natural sires, which will lack the genetic potential of the best sires in their respective breeds.*

Timed Breeding and Cow Herd Management:

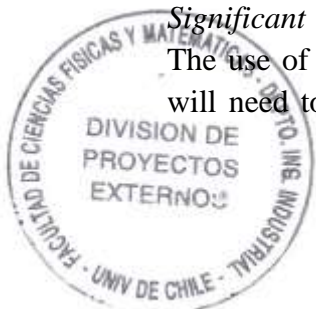
The use of artificial insemination requires that cow herds be managed for having all animals bred within a 65 day period. This will allow for three breeding opportunities with a 21 day estrous cycle. This creates several efficiencies in cow herd nutrition, supplementation, and weaning management. One of the most important aspects of this is that the cow herd can be managed for optimum colostrum production, which occurs in the last 5-6 weeks of gestation. The production of a high-quality colostrum , in sufficient quantities, is essential for the long-term survivability of calves raised using all-natural production practices.

Forage Management and Feed and Soil Testing:

Proper grass-based management requires having forages that are as high in energy and protein as possible. It also requires having soil pH in a range that optimizes the uptake of minerals by the forage, as mineral nutrition is critical to optimizing calf growth on forage as well as being critical to shorten the post-partum interval, the time from when a cow or heifer calves until she is capable of rebreeding, physiologically. *The development of soil and forage testing will be a necessity in this program, as it is in the U. S., for optimum management and production.* The laboratory I use, Rock River Laboratories, has a new business located in Temuco, Chile: <http://rockriverlab.cl/es/>.

Weaning and Cattle Handling Methods that Reduce Stress:

Significant changes will need to be made to the traditional cattle processing techniques used. The use of roping and dragging cattle to the ground for dehorning, castration, and vaccination will need to end. The use of cattle corrals with head chutes that reduce stress will need to be



used. This is the area that will, in all probability, meet the greatest resistance. The point to keep in mind is that the consumers of this project's products are paying a premium for a product that they believe to be raised in an 'unspoiled' area of the world. These consumers are, on average, 3 generations removed from agriculture. The change to modern cattle handling techniques that minimize pain, fear, and suffering will be required to meet USDA Process Verification and Humane Handling requirements. Finally, *achieving high marbling will require castration, and the sale of meat products from steers and heifers to the export market.*

Finishing on Highly Digestible, High Protein Forage:

The development of a forage-based feeding protocol during times when forages are not actively growing will be critical to the success of this project, as beef processing plants require cattle throughout the year, not just seasonally. This may include the use of haylage, ground hay, or stockpiled forage. All of these systems will require protein and mineral supplementation of the cattle, or they will be unable to achieve adequate levels of intramuscular fat (marbling).

The use of an appropriate mineral mix for cattle in late gestation through early lactation, late lactation through mid-gestation, and in the growing stage and finishing phase on silage will need to be addressed. This is an area of effort that is completely lacking at this point in time. It is, however, critical to the advancement of the beef industry in Chile.

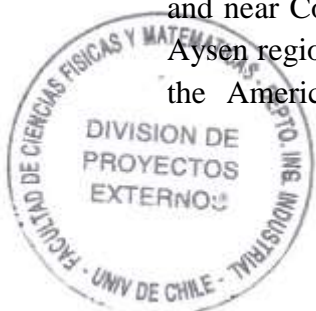
Suggested Programs to Support the Beef Industry:

Angus Genetics to INIA Tamel Aike:

I will work for the donation of 40 straws of high-marbling genetics from Select Sires <http://www.selectsiresbeef.com/>. The bulls of choice will be GAR Progress <http://www.selectsiresbeef.com/index.php/bull-database-view-page?bid=159&breed=Angus> or GAR Prophet: <http://www.selectsiresbeef.com/index.php/bull-database-view-page?bid=158&breed=Angus>. These genetics provide exceptional growth and carcass characteristics, especially marbling, and should provide for the beginning of the use of some of the best Angus genetics in the world.

Development of Aysen Beef Carcass Collection:

At this point in time, very little is known about the quality of beef produced in the Aysen region. The reason for this is that by the time an animal travels for 3 to 4 days to a processing facility, the marbling can change dramatically. I recommend that a coordinated effort be undertaken by INDAP, INIA, CORFO, and the University of Santiago, Chile, and any other knowledgeable people involved in agriculture in Chile, to initiate data collection from beef processing plants in and near Coyhaique. This information is critical to determining a baseline of production in the Aysen region. The ribeye area grid and USDA marbling standards sheets can be purchased from the American Meat Science Association: <http://www.meatscience.org/students/meat-judging->



[program/meat-judging-resources](#), and the information can be determined very easily with minimal cost.

The minimum data to be collected should be:

Farm of Origin

Animal Breed

Animal Sex

Animal Age

Digital Photo of Live Animal

Live Weight at Harvest

Carcass Weight

Marbling Score

Ribeye Area

Backfat depth

Finally, the clearing of trees and planting of fields has resulted in large areas under cultivation. The soil is very fine and loose, and any rain or snow events, as well as the movement of animals across streams, can create sedimentation and erosion into water sources such as streams, rivers, and lakes. I would recommend the use of buffer zones around water that livestock cannot enter, and which must be planted to grass, rather than being cultivated. This recommendation is for the protection of the region's most valuable natural resource, water, and the world-class recreation that pristine streams, rivers, and lakes provide.

I make these recommendations based on over 40 years of experience in beef cattle production, over 30 years of experience conducting research with cattle nutrition and management as they impact carcass and meat characteristics, and over 15 years of experience in the development of branded beef programs for U. S. consumers. Please contact me if, in your opinion, I can be of any help in the future.

Sincerely,



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