

The Potential of Alternative Animal Feeds for Newfoundland and Labrador

Atlantic Consulting Economists Limited
in association with
The Newlantic Group
Dr. A. Fredeen, R. Campbell, Dr. D. Anderson
D. Harwood and D. Vallis

As a summary of this report, it was felt that Chapter 8 provided an overview of the findings. The title of this chapter is "Economic Overview and Strategy". This report was contracted to investigate the potential of Alternative Animal Feeds in this province.

A development strategy is proposed in this chapter designed to verify the value and safety of these feeds and to identify the systems which will be needed if they are to be used with confidence. The strategy is a dual approach to the research, development and technology transfer needed, involving a program of practical application on-farm and development on a pilot production scale, complemented by a program of economic and scientific research. These activities should be accompanied by human resource development activity and by a focused effort to identify and meet potential concerns of producers and public over the implications of animal feeds based on waste products.

Overall Objectives

The most immediate objective of the development strategy would be to verify, by a combination of practical trials and further research, the production techniques, the nutritional values, health and safety aspects - and hence the economic benefits - of the most promising materials identified in this report.

An added objective is to increase **(a)** the farming community's awareness of the possibilities, techniques and problems involved in the use of opportunity feeds and **(b)** the awareness of the business community - whether farming or fisheries oriented - concerning opportunities in the production of alternative feeds. A longer term objective should be to improve Government's technical and economic understanding of those feed materials which apparently do not offer such immediate economies, by a program of literature review, economic analysis and research and development.

At the same time, it should be an objective to evaluate the extent to which the use of waste materials for feeds also helps to solve actual and incipient environmental pollution problems. An underlying and long term objective should also be the encouragement of a "mindset" to pursue greater self-sufficiency in feedstuffs of all types in the Province. This, along with improvements in the conservation of energy, will reduce the sector's sensitivity to prices of inputs set by outside markets and contribute to the sustainability of agriculture in Newfoundland.

A final objective should be to develop sound rationale and technology for the use of alternate feeds, which meet potential health and safety concerns.

Specific Goals

Of the alternative feed stuffs considered in this report, two - fish silage and fish silage concentrate - appear to offer enough cost advantage to farmers as alternative feeds to be considered as subjects for a program of practical development and farmer-education to be sponsored by Government.

The first immediate goal of an alternative feed development strategy should be to undertake a program of pilot scale production, on-farm trials, and related laboratory work as necessary, on these three alternative feeds, with respect to:

- a. Nutritional values with respect to dairy animals and other ruminants; and then fur animals and swine;
- b. The technicalities and costs involved in production;
- c. Introduction and testing of on-farm feeding systems to accommodate the alternative feeds;
- d. Quality and safety aspects of food from the same animal groups; and

- e. Requirements for feed quality management related to an opportunity feed supply system.

Proper planning and control will be important in the processing and on-farm application trials, both for the integrity of the results and to avoid premature enthusiasm or discouragement from interim findings. Requirements for proper program management are noted in a later section of this chapter.

A second goal should be to plan a program of research to identify and clarify some apparent gaps in the knowledge of subject areas discussed in this report. This research should be used to plan further development work and to define areas of concern over health and safety.

Recommended Elements of a Development Program

A program to satisfy the goals listed above should have the following components.

Pilot Production of Alternative Feeds

Fish Silages

This program, with its associated R&D and industry development, could well be undertaken jointly with the Provincial departments responsible for fisheries and industry /technology.

Experience in fish silage production should be gained on a commercial level by means of a small scale plant operation. Alternative approaches include the following initiatives:

- Canvas meal-producers for expressions of interest in the production of further pilot quantities of silage, and in making trial batches of concentrate.
- Call for expressions of interest from entrepreneurs to engage in a joint venture with a meal plant. In the case of seal silage, pursue the notion of this product as a development opportunity again with community/rural development or sealers' organizations, once the value to farmers is established.
- Bring trial quantities of fish silage concentrate from Nova Scotia, with which to conduct a program of trials and familiarization with different animal producers. This would allow the material to be presented to farmers as an established product, complete with quality specifications.

Feeding Trials

Feeding trials of fish silage as a supplementary ration should be conducted with lactating dairy cows and heifers, beef cattle and sheep; and trials of fox feed should be continued. In addition to scientifically controlled studies, there is promotional and "awareness" value in controlled on-farm trials also.

Testing of food products from the animals should be included as part of the trials.

Development of Quality Control Methodology

The analyses and procedures required for each type of opportunity feed should be established from the standpoint of nutritive value and of health and sanitation. Experience should be gained in routine testing in step with the production of pilot quantity feeds. The feasibility of testing by farmers should be examined and also the provision of a commercial or government service which would allow full exploitation of opportunity feeds.

Exposure of Producers

Producers should be encouraged to participate in training, pilot production trials, feeding trials and quality management, in order to get feedback on practical aspects of production and handling of the feeds. Project agreements with the farmer should include the evaluation of different dispensing systems according to the individual's feeding system.

Farmers' participation will also have the benefit of fostering the farming community's awareness of the potential benefits of alternative approaches to the procurement of feedstuffs, whether by using opportunity feeds, or by organizing to take a more active part in the manufacture of feed in general.

Courses could be developed for farmers, government staff and for people in industries which are potential sources of by-product feed materials. These courses would deal specifically with the subject of biological

variation in local materials, and with developing means to predict, analyze for and deal with variability in the nutrient content of feedstuffs.

Health and Safety Information

It will be important to prepare a thoroughly researched rationale for the use of wastes in animal feeds, in advance of concerns on the part of producers and the public. Such concerns are both inevitable and proper, and call for a responsible and factual response. This should draw on the results of a thorough literature review, and familiarization with concerns, practices and recent research elsewhere. The aim should be to identify the gaps in knowledge and the essential issues to be researched, both in the pilot production of feedstuffs and in the monitoring of the animals in feeding trials.

Reassurance to the producers and sound information to the public must have a basis in a thorough understanding of the essentials by which animal health and food safety are assured. Important issues involved will be the implications of achieving, or not achieving, sterility in manure-based products; the nature and the fate of antibiotic, hormone and other drug residues; and the transmission of diseases, by whatever means, between animal groups. Positive aspects to consider are the environmental and conservation aspects of utilizing wastes, the analogy with composting, (and perhaps, in the case of acid silages, pickling) and the use of processed animal manures and fish waste fertilizers in commercial horticulture and home gardens.

Research and Development

The study has thrown up many subjects for more comprehensive review, to be followed by economic and scientific research where information is shown to be lacking.

The following are some examples of subject areas for R&D and technology transfer, suggested by the various observations in this report, and given in a suggested order of priority.

- Continued feeding trials of seal silage, meat and meal to compare the nutritional characteristics of the three products in different animal groups;
- An analysis service or capability for small farmers adjusting feed to accommodate to opportunity feeds in general;
- Liquid feeding systems developments for small farmers;
- A practical trial of ensiling poultry offal and mortalities, by acidified hydrolysis or by natural fermentation, as a method of profitable disposal for western Newfoundland farmers;
- The question of ensiling mixed wastes from, for instance, fish and poultry;
- The practice and economics of ensiling marine wastes in the presence of salt, optimizing the production and separation of a solid component: characterization of the protein/NPN (nonprotein nitrogen) in this material by analysis, accompanied by rumen degradability tests and growth, feed utilization and palatability trials with both ruminants and monogastrics;
- Binders and absorbents for silages, to allow pelletized feed to be made for poultry;
- The value of making fish- and perhaps seal silage by natural fermentation with imported grains or perhaps food wastes should be assessed from a cost standpoint.
- Experimental production and characterization of lumpfish silage;
- The prospects of cheap animal feed as a by-product of the processing of crab and shrimp waste into higher-value products;
- A simple practical trial of making a dried capelin product suitable for blending into animal feed, to estimate true labour costs;
 - The characterization of the ensiling reactions and the evaluation of nutritional characteristics of the products, for instance

- The protein/NPN spectrum in silages and hydrolysis products made under different conditions of time, temperature, pH and enzyme concentrations;
- The protein/NPN spectrum in meals made from silages, as compared to conventional meals from the same species
- Pulp mill by-product streams as carbohydrate sources for ensiling by natural fermentation;
- The utility from an animal feed standpoint of the fractionation of manures, for instance by filtration into solid and liquid components;

Economic Research

- Pursue the question of seal utilization at an economic policy level. Newfoundland is short of meat meals for animal feeds. Feed manufacturers would use more if it were available at the price of local poultry meal.
- Attempt to define the fish waste prospects for 1994 and beyond. This needs to be done on a plant-specific basis as far as possible, since offal is in such relatively short supply. Confer with (Fisheries Products International) FPI and look for complementary areas of interest. FPI may be able to help with know-how, or undertake a joint program, on technical questions outstanding concerning enzymatic hydrolysis, or on the possibility of an intermediate crude liquid product from their process.