

## **A Study on the Systematic Use of Computers for Managing Beef Cattle in Alberta**

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### **Introduction**

On-farm computer usage in Alberta is gaining popularity as software for beef enterprise management becomes more user-friendly, the price of hardware drops, general computer usage increases, and as information available on the "Electronic Highway" draws interest. Beef farm managers, when compared with farm managers in other livestock groups, are positioned to improve computer usage within their industry.

Most civilizations can trace back their roots to an agrarian foundation. In ancient China and Mesopotamia farmers cultivated grains to eat and harvested fodder for domesticated livestock. History tells us of farmers producing first for their families and communities. As production became more sophisticated, it allowed for expanded trade with others. This expanded the trading area for local foodstuffs and allowed diets to be supplemented. So, what has changed since then? The main concern still remains to produce and distribute food.

However, what has changed is that farm managers no longer produce foodstuffs to be only locally distributed, but also for international consumption. Methods of growing, processing, and distributing food have changed as well. Today, tractors are mostly used in place of humans and animals to do any labourious work. Chemical fertilizers are used to supply nutrients to crops where there aren't enough natural fertilizers, such as manure. Meat is frozen to extend the amount of time it can be kept. Drying and cooking are ways to process meat so it can be stored and shipped for long periods of time without spoiling. Airplanes, ships, trains, and trucks constantly haul foodstuffs to areas in the world where there is a demand. Processed food has even made it all the way into space with astronauts. However, the main concern has and will always be how to produce food safely and efficiently and to then distribute it the cheapest way possible.

Due in part to man's desire to harness nature's gift of food for the market economy, the emphasis is on developing cheaper and more efficient production methods. Governments strive to provide a cheap food policy to their electorate. As a consequence, farm managers are forced to find more efficient ways to do their business in an effort to preserve as much of their diminishing income as possible.

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## Beef Export Markets

The demand for meat, especially beef, is increasing in Asian countries. This is due in part to these countries experiencing a higher standard of living with greater amounts of disposable income. According to the United States Department of Agriculture (USDA), Koreans consumed 7.0 kg of beef per person in 1991. This has increased to 8.2 kg per person in 1994. 1994 estimated sales of Canadian beef to Japan alone could reach \$39 million, from 48,000 head of cattle. Ted Haney, Executive Director of the Canada Beef Export Federation, states that 25% of all beef produced in Canada is exported. Canada's beef exports have increased 55.5% from 1992 to 1993. Main destinations are the U. S. A., Korea, Japan, and Taiwan. 90% of Canada's exported beef goes to the U. S. A. The Asia market alone, as quoted in the February 16, 1995 edition of the *Western Producer*, imported 11,000 tonnes of Canadian Beef in 1994, 54% more than in 1993.

High quality beef and a weak Canadian dollar are two main factors affecting the improved beef exports. If the Canadian dollar strengthens and countries like the U. S. A. and Australia, who have lower production expenses, rally to increase export sales, farm managers in Canada will have to cut production costs to continue to compete. Ways of cutting production costs are to market more efficiently, access more and better information, and improve management through computer technology.

Computer usage in farm production and management is an area of increasing importance throughout the world. In 1983, the Department of Rural Economy, Faculty of Agriculture and Forestry at the University of Alberta published a study entitled "An Assessment of Current and Potential Use of On-Farm Microcomputers". In the report, the authors stated, "Alberta is in a state of revolution—the computer revolution". Although the number of computers used on farms then was very few, the extent of their use was being emphasized as a "computer revolution". As recently as 1991 the federal government census revealed that only 12.2% of Canadian farmers had personal computers. This percentage is a much larger proportion than existed eight years previously but still small when compared to other industrial sectors.

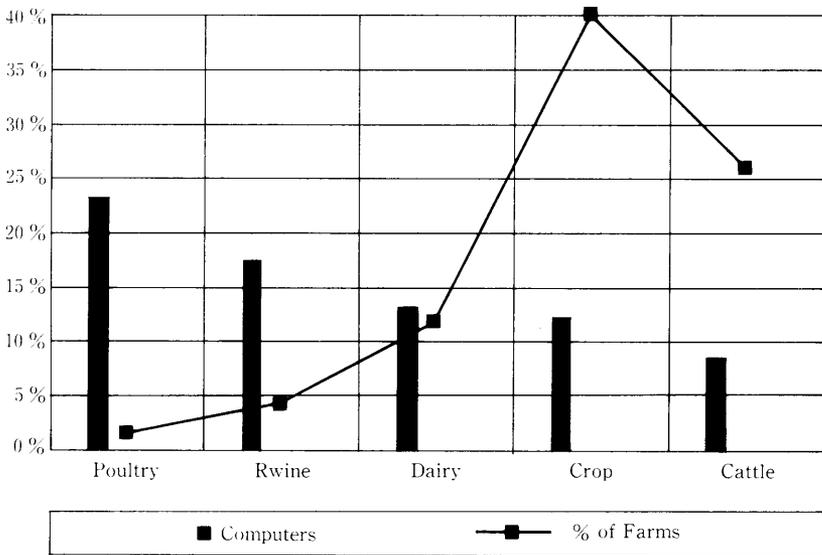
Students at agriculture colleges and universities have had to take computer training since as early as 1984. In these early courses only word processing, spread sheet operation, and simple programming in Basic were taught. The early accounting and inventory software developed for farm use proved to be very cumbersome and inflexible for the varied farm situation. As a result, there was little incentive for the beef farm manager to justify the purchase of a computer.

In 1995, trends in extension education and agriculture service indicate that a new "computer literate" generation of farm managers is taking control of the farm business. Bruce Waldie, computer applications manager of the Alberta Agriculture Farm Business Management Branch, estimates that on-farm computer use is presently reaching 40%. However, when broken down into categories, not even 10% of beef producers are using computers as a farm management tool (Figure 1).

Federal government funding for provincially managed education projects has resulted in an overwhelming enrollment in farm management programs emphasizing use of computers. One such project, entitled Farm Business Management Initiative (FBMI) started Phase I in 1993 and finished March 31, 1995. The project has been extended into 1998.

This Renewal Phase will focus more on self-directed and distant education. Through the current phase of the initiative, 22 of the 68 courses (33%) emphasize computer use. FBMI is part of the National Farm Business Management Program involving private agribusinesses, provincial agriculture departments and agriculture colleges and universities (Appendix 1). The objective of this initiative is to provide the participants with farm business management training and agricultural information that will enhance the business skills of farm managers.

**Figure 1** COMPUTER USE BY FARM TYPE



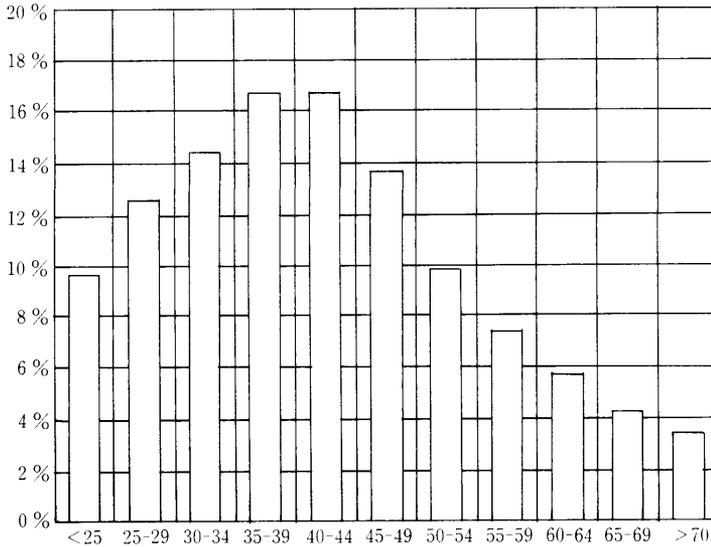
DATA : June 1991. Canada Census

Beef farm managers are using software that prices and keeps inventory organized, calculates the cost of production for both the parents and offspring in a beef enterprise, and estimates return from the sale of commodities at various prices. Sophisticated book-keeping and tax programs allow farm managers to carry out bookkeeping procedures and calculate the amount of tax with minimal use of an accountant’s services. By using these programs, the beef farm manager has the opportunity to understand where yearly expenses arise and thereby discover ways to reduce unnecessary spending. Major management decisions can then be made by combining information from four separate sources : data from each farm enterprise, the average estimated production both locally and provincially, market prices as they occur seasonally and regionally, and future commodity prices as quoted in the U. S. A.

These decisions can then be enhanced using national and international data from satellite and on-line information services. Figure 2 presents 1991 statistics that show the percentage of computer users for various age groups of Canadian farm managers. Young farmers often don’t assume full farm management responsibilities until their thirties. This, combined with their increased computer training and knowledge of application, makes them suited for using computers as farm managers. The three age groups where

computer usage is the largest, 30-34, 35-39, and 40-44, bring to the farm a highly developed understanding of computers and their various applications. As these groups age, the use of computers on farms will undoubtedly show increase.

**Figure 2** Computers by Age Canada



Data : June 1991. Canada Census.

Basic farm management is based on the concept that the right information and its use allows for a more accurate decisions. The target net return for commodities is easier to achieve when all costs can be included in detail. For example, estimates of the amount of feed for cattle can be done prior to purchase to avoid buying excess inventory. Least cost rations can be formulated from home grown feeds and with the computer identifying the cheapest supplements to use. Poor-producing animals can also be identified through production records that are compared to herd and provincial averages. In addition to on-farm management software, farm managers can also access information from the Internet bulletin board system (BBS) on the FBMinet. The FBMinet is a network service of about 12 computer bulletin boards across Canada.

Current information from extension agents, producers, machinery dealers, and other sources can be located on the FBMinet. Access to provincial specialists, market information, research results on new technology and up to the minute weather reports are also possible through other on-line information services.

**The Beef Cattle Industry**

In Western Canada, and especially Alberta, agriculture is comprised of two major sectors when classified by number of farms and farm cash receipts. Cattle operations occupy the position as the major sector according to 1993 Alberta agricultural statistics. Farms raising cattle numbered 23,918, earning \$2,147.8 million followed by small grains

where 18,802 farms generated \$1,287.5 million.

The province of Alberta alone has a land area of 638,505 square kilometers. This is approximately 1.7 times the size of Japan which is 377,737 square kms. Alberta has an abundance of cultivated and pasture land and a population not quite half (47%) that of Hokkaido, allowing for more produce to be grown than is consumed.

In 1993 the financial revenue from agriculture added \$2,140 million to the gross domestic product of the Alberta economy. This equates to about a 3% overall contribution. With this in mind, it is important to note that the agriculture economy is highly dependent on exporting excess production, whether it is across domestic or international borders. For the cow-calf producer in Alberta, the beef trade between Canada and the United States is an important price stabilizing factor, providing an effective floor price at the level of the North American market. This is mainly due to the fact that there are approximately eight times as many cattle in the U. S. A. as in Canada and there is an open border policy for beef cattle trade.

Beef farm managers are mainly independent of national agriculture policy and contribute funds to co-operative associations that promote thier product. The decision of when, where and for how much to market is left solely to the producer and his skill to maximize his profits. An accurate analogy to describe cattle producers, the most unregulated of farmers, is as independent business managers at the mercy of nearly pure market forces. To survive, it is essential for cattle producers to make the most of good information, and to be able to act quickly on opportunities is critical.

Surprisingly, even though farms raising cattle comprise the bulk of all farms, the use of computers is the lowest at approximately 10% (Figure 1). This contrasts with that of poultry farms that make up the smallest percentage of total farms but have the highest usage of computers. Two reasons may be the intensity of the management as well as length of production cycle for the enterprise. For cattle, it takes one year to complete a full biological production cycle and 10 years for one price and supply cycle. This is considerably longer then the cycles of other commodities, meaning that beef producers have to anticipate price fluctuations and adjust their production accordingly. One problem that arises is that there is a two-to three-year time lag between when the decision is made to adjust the size of the breeding herd and when an actual change in the beef supply occurs. As a consequence prices fluctuate with longer lasting price periods at a semi-uncontrollable pace (Gracey, 1981).

### **Learning About Computer Use**

Computer use by beef farm managers is increasing due to development of educational courses by private agencies, government sponsored agencies and local colleges. In 1984, the Alberta provincial government began administering *Computers on Wheels* program, an introductory computer training series. The objective is to provide awareness about computer use that will gradually advance to introductory courses on computerized farm record keeping, spreadsheets and databases, and electronic communications (modem). In 1994, this program delivered courses in 45 communities throughout Alberta. An instructor from each of the province's four agriculture colleges is assigned a territory. Using 20 portable laptop computers with printers, the instructor teaches a series of practical lessons over two or three evenings. This program continues to provide an opportunity for more

then 500 farm managers to enhance basic computer use skills.

### **Information Services for Beef Producers**

Information networks and satellite information systems use a personal computer or monitor linked by a modem or satellite to a distant host server that relays accumulated information to the user. Most of the data and information that is gathered, is organized, evaluated, summarized, and arranged in graphic form for transmission to subscribers (Figure 3). The information on cash cattle, futures prices, and weather, which often fluctuate hourly, is needed to make production and marketing decisions. The information is usually "volatile" in that it is useful for a very short period time for immediate or near future decision making. For example, a source that can only provide information on market prices that is 3 days old will not benefit the cattleman wanting to sell at a current price.

By continually watching for trends in the market price, locally and in the U. S. A. and knowing what a projected price for cattle may be, a beef farm manager can best decide when he should sell. Traditional sources of information, such as radio and newspapers, offer good price summaries. However, electronic media can offer up to date information every few minutes to provide an on-the-spot opportunity to select a desired price.

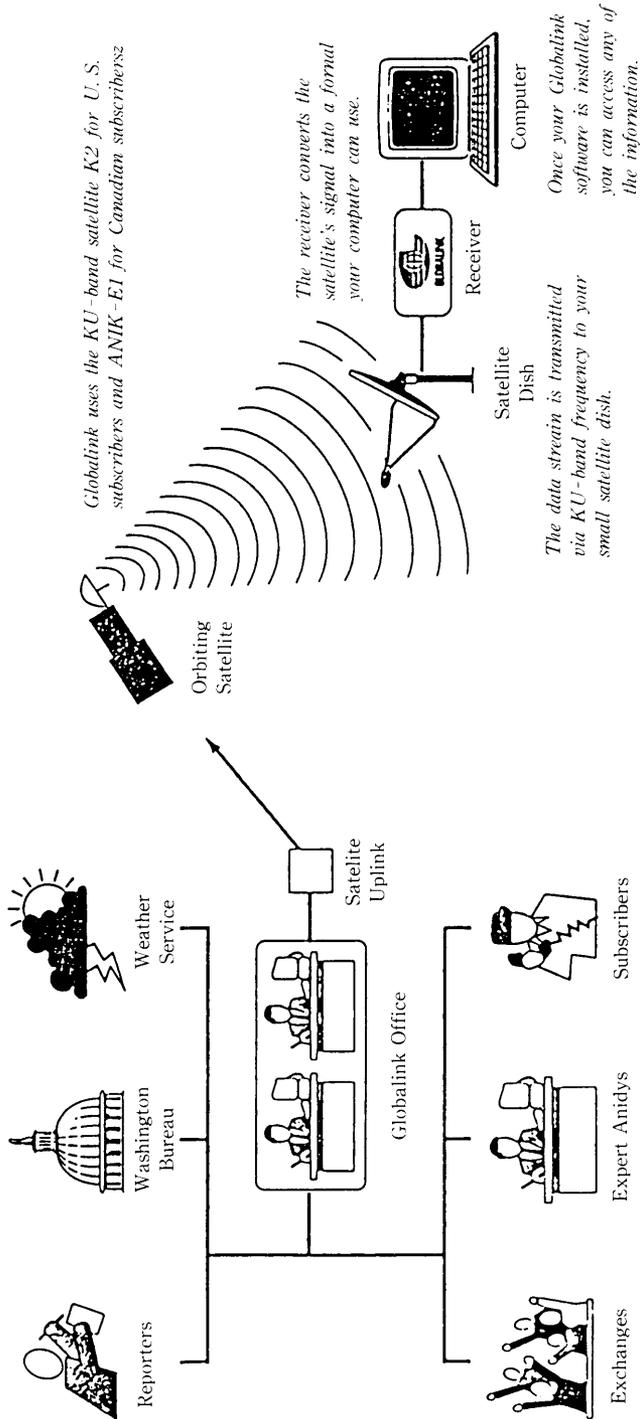
Local area networks (LAN), that connect regions via personal computers, are becoming more common in Hokkaido. Weather summaries and production information are main items exchanged through these systems. Farm managers can list cattle for sale through their co-operative. Through LAN, cattle can be selected by gender, age, producing ability and price. As farm managers work more closely with each other and begin to manage their own computer information networks, other services will be developed. Forage suppliers, new and used machinery for sale, custom work, and eventually farm labour requirement information will most likely be listed. Access to research results and news items will also be more readily available in the future.

In Alberta, beef farm managers can choose between two Canadian and two U. S. A. originating information services. All offer market prices, weather forecasts and some form of market summary. As mentioned previously, 90% of exported beef from Alberta goes to the U. S. A., mainly as live finished cattle sent for slaughter. This has a major effect on Canadian cattle prices where the market operates as a function of the rise and fall in U. S. A. production. For example, crop failures or decreases in livestock production in the U. S. A. generally increases demand for Canadian produce causing higher prices paid for Canadian produce. This is why U. S. A. based services, listing the price paid for live cattle, are important sources of information demanded by beef farm managers. Currently, information systems are being used by medium to large operations grossing over \$100,000 per year. These farm managers are marketing larger volumes and require more marketing options and control over pricing. Ultimately, selecting the right subscription providing the most current information, whether on the price of cattle or otherwise, is the most beneficial. The following is a description of four commonly used information services.

#### **A) Data Transmission Network (DTN)**

DTN is an electronic information service delivering quotes on agricultural commodities, news, and weather forecasts for the agriculture industry. It has been available since

Figure 3 The Flow of a Satellitas Information System.



Data ; Users' Guide to Globalink Features and Benefits.

1984 from Omaha, Nebraska and is the largest satellite data broadcasting network in the U. S. A. DTN serves approximately 65,000 agriculture subscribers in North America, 1,500 of which are Canadian.

The start-up fee, including the first month subscription fee, is \$550.00Cdn, after which \$155.00Cdn per month is required. Equipment needed includes a colour monitor, receiver and an 86 centimetre satellite dish that are supplied and maintained by DTN at no cost. The data stream is transmitted from DTN's main office to a satellite, from the satellite to the subscriber's dish. The dish is set-up outside and faces toward the sending satellite. A cord connects the dish to the receiver that translates the data into images on the monitor.

From the terminal, the operator retrieves data and information, usually once or twice a day. Market prices and summaries of major commodities are in report or chart form to determine the best time to sell. Time-sensitive information, updated every 15 minutes, includes continuous weather summaries on rainfall, international weather commentary, and precipitation at the county level. This is important during spring seeding, chemical spraying, haying, and harvesting when farm managers need to be able to determine if and when it will rain, what the drying conditions are like, and probability and strength of wind. In addition, there are segments on futures, options, market conditions and industry and financial news. This package is for farm managers who trade more actively and need greater detail in commodity and financial data.

## **B) Globalink**

In many respects Globalink is similar to DTN in that it is a satellite-delivered marketing information service based in Cedar Falls, Iowa. Figures on the number of subscribers are not available. Major items Globalink offers are: 1) futures and options prices for commodities and the Canadian dollar are listed on major Canadian and U. S. A. exchanges every ten minutes, 2) current cash prices, and market commentary from analysts at major trade centres like Winnipeg, Canada and Chicago, U. S. A.; 3) four daily updates of on-line news that include reports on world events, trade policy shifts, national and international weather forecasts and agriculture news.

The farm manager purchases the receiver and satellite dish from Globalink to connect to his personal computer. The 86 centimetre satellite dish is connected to a personal computer through a receiver. Using his own computer, the operator can save and manipulate data to be set up in chart form. Startup costs and equipment purchase are \$1,250.00Cdn plus \$85.50Cdn per month. It should also be noted that Globalink's wide range of services are included in the monthly fee whereas DTN charges extra for the more limited features offered.

Globalink offers very good charting capabilities with less detailed graphics than DTN. Weather maps are more basic without providing detailed forecast conditions. The Canadian News Wire section describes market statistics, Canadian Prairie Street Price summary, grain export reports, Western Canadian hog and cattle market summary, Canadian government economic reports, Canfax commentary, and other information sources. Canfax is a market monitoring agency operated by the Alberta Cattle Commission operated by its members to provide daily feeder cattle, calves, slaughter cows and bred stock reports. In addition, Canfax offers a weekly information newsletter dealing with

factors affecting market analysis and decision making. Farm managers using Globalink will have the advantage of information coming five minutes faster than on DTN, due to a faster turn-around time and the capability to save it on a computer.

### **C) MarketRoutes**

This on-line information and quote service, formally called Grassroots, is an original Canadian service offered since 1982. At \$39.60Cdn per month it is the cheapest market information service, requiring no start-up fee, satellite dish or receiver. Instead, access is gained by a user's personal computer "dialing-up" a regional telephone number that connects to the MarketRoutes system in Winnipeg, Manitoba, Canada. The first two hours of use are free, with regular long distance rates applying for additional on-line time.

During the early to mid 1980's this system provided information regarding acreage of grain crops seeded internationally, weather trends, and periodic commodity price quotes. Other information included a new and used machinery market section, and airline schedule information. Presently, the system has been extended to include up-to-the-current-day financial market quotes, daily commodity prices at major Canadian and U. S. A. markets and technical market reports. Weekly analysis and marketing strategy suggestions are updated every 15 minutes. MarketRoutes is mainly targeted to Canadian investors. The total number of users is not released by the company.

### **D) FBMinet, Bulletin Board Services (BBS)**

FBMinet was developed by the National Farm Business Management Program in cooperation with provincial agriculture departments and is part of the FBMI for the purpose of exposing farm managers to the Internet. Differences that this system provides are summary market information as opposed to instant, updated market quotes. There is no start-up fee nor monthly charge, only the long distance phone costs. The major difference between it, DTN and Globalink is that a satellite dish and receiver are not needed. It is a totally interactive system that allows operators to comment on information others have put on the BBS. It is becoming more popular among smaller operations due to its being easier and cheaper to access. The FBMinet is a network service of about 12 computer bulletin boards across Canada. This BBS is dedicated to the exchange of farm business management information. It provides additional services such as access to information from producer discussion groups and provincial and university researchers.

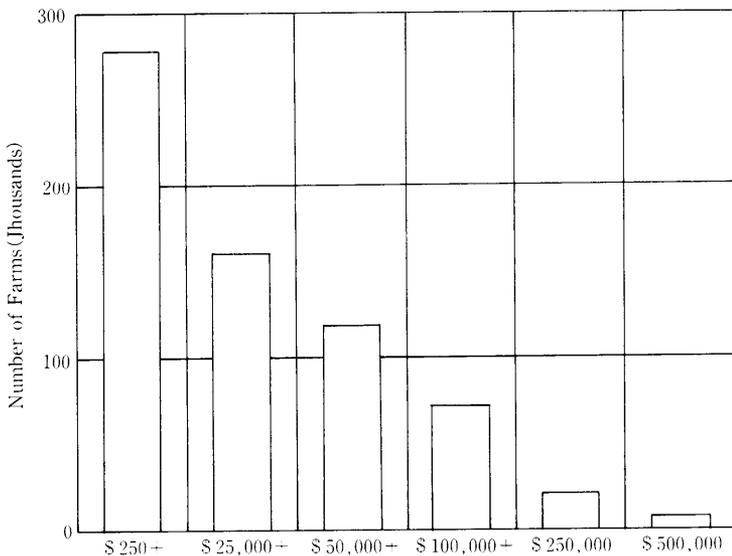
To connect with a BBS, a beef farm manager, through his personal computer, dials up the host computer located in the provincial government's system operator's office. The system operator is usually a provincial government specialist working in the area of farm business management. During the night the host computer automatically exchanges information and files input collected during the day.

Shared public message areas found in the bulletins are called echoes. Echoes provide a way to enter a message on a bulletin board service and have it sent overnight to other BBS users. Beef farm managers from other provinces could then read and reply to the message. Interactions with other users of the FBMinet also include those with extension specialists, university researchers, agriculture media, and agribusiness consultants. There are only agriculture related echoes available on the FBMinet, such as farm finance, livestock production, marketing and commodities, GATT news and discussions.

On Internet in North America alone, there are well over 50,000 BBS's in operation with topics ranging from the space shuttle to environmental concerns. Internet itself is accessed by an estimated 30 to 50 million users worldwide.

This mode of information retrieval is not the quickest when immediate market specific information is needed. However, for the smaller operation it offers information on how to find lower cost capital assets for sale, as well as buyers and sellers of niche market and small volume products. The exchange of information on production and management is an important feature as colleges, universities and private consulting groups organize to offer training courses on the FBMinet. Currently, a pilot project training course for cow-calf farm managers is being developed to be taught via the FBMinet including such training segments as : feed cost summaries, cow-calf enterprise budgeting, a ration balancing segment, and developing a cow-calf budget. The purpose is to give the greatest exposure of training in areas like computer use and management. Another reason is to attract new users to the FBMinet creating a varied source of information exchange. The FBMinet seems to show the most potential for growth in having the greatest effect on technology transfer in agriculture. However, before this can take place an increase in computer literacy will be required of farms that gross between \$25,000 and \$100,000 per year. For the purposes of this paper, farms earning under \$25,000 are too small to consider computer use and in many cases farming is secondary to off-farm income. Of the 93,794 Canadian farms earning between \$25,000 and \$100,000, 58% are currently non-computer users, and are the target group for any computerized training efforts (Figure 4-1, 2).

**Figure 4-1** Farms in Canada Gross Sales Per Year



DATA : JUNE 1991. CANADA CENSUS.

**Figure 4-2** Canadian Farms Gross Sales per Year

Gross Sales	Number of Farms	% of Total No. of Farms
\$ 250+	280,043	100 %
\$ 25,000+	162,290	58 %
\$ 50,000+	118,365	42.3 %
\$ 100,000+	68,469	24.5 %
\$ 250,000+	19,082	6.8 %
\$ 500,000+	5,892	2.1 %

Data ; JUNE 1991 CANADA CENSUS

Information services as described above, whether accessed by satellite or modem, are promoted by the company or agency that developed them. It is up to each beef manager to decide which service best meets his needs. In the case of FBMinet, information from across the country is accessible and the variety of options are more numerous due to unrestricted access, and as mentioned earlier, the only cost is the long distance charge to the nearest system office.

Once the majority of producers have mastered the use of computers, increased development of information services, software, and BBS's will follow. As education in the area of farm business management is more widely distributed, a streamlining of agriculture production will be inevitable. Potential for similar network use in Hokkaido is very good. There are farm leaders in organizations and government that could assist producer coalitions to support needed changes in national agriculture policy. Using a network, members could exchange opinions and discuss how policies are affecting their farms and organizations. Also, extension training could reach producers too busy to be able to attend traditional learning activities or those who are more comfortable learning in the comfort of their own home.

Reg Kontz, Head of Alberta Agricultural Education & Community Services points out that the future focus for the provincial government's extension education delivery will be electronic media. Video and computer based instruction learning will be the main ways of transferring new technological information to farm managers. More and more Canadian college and government extension courses are becoming distant-learning-based to save time, resources, and money. As these considerations become increasingly important in other countries, it would make sense that these technologies would be applied in Hokkaido as well.

### Software Produced for Extension

#### **COWCHIPS : A Beef Herd Management Program**

This program was developed for cow-calf farm managers to identify opportunities for improvements in their herds. To operate the program, an IBM or compatible personal computer is required to manage farm production information collected on the farm. *Cowchips* operates as five modules and one utility (Figure 5). With complete herd information entered, the user can investigate production, marketing and financial management alternatives. An average 640K RAM, hard drive PC with a CGA or better monitor has the ability to operate the program. Reports can be generated in the Records, Troubleshooting, and Cow Lifetime Productivity modules. Finally, the Appendix provides requirement tables, feed tables, and two data bases, Alberta feeder prices and Alberta live

slaughter cattle prices.

This program is a project funded by the provincial government using specialists both from the Alberta Government and the University of Alberta. As a government product, it is distributed and promoted by provincial specialists and is included in the FBMI course series. Feedback on the program has been positive as it encompasses most needs. It is suitable for farms with more than 20 head of breeding cows. Presently, training courses are offered over two full days or in four evening sessions. The program's modules are as follows.

**CowChips Main Menu Description**

(adapted from Alberta Agriculture, Food and Rural Development brochure)

**A) Records**

This module provides the format for entering the information required to evaluate the production and financial management of a cow-calf herd. Information is entered either on a herd basis or an individual cow basis.

**B) Trouble Shooting**

The four G. O. L. D. production indicators (Growth, Open cows, Length of calving

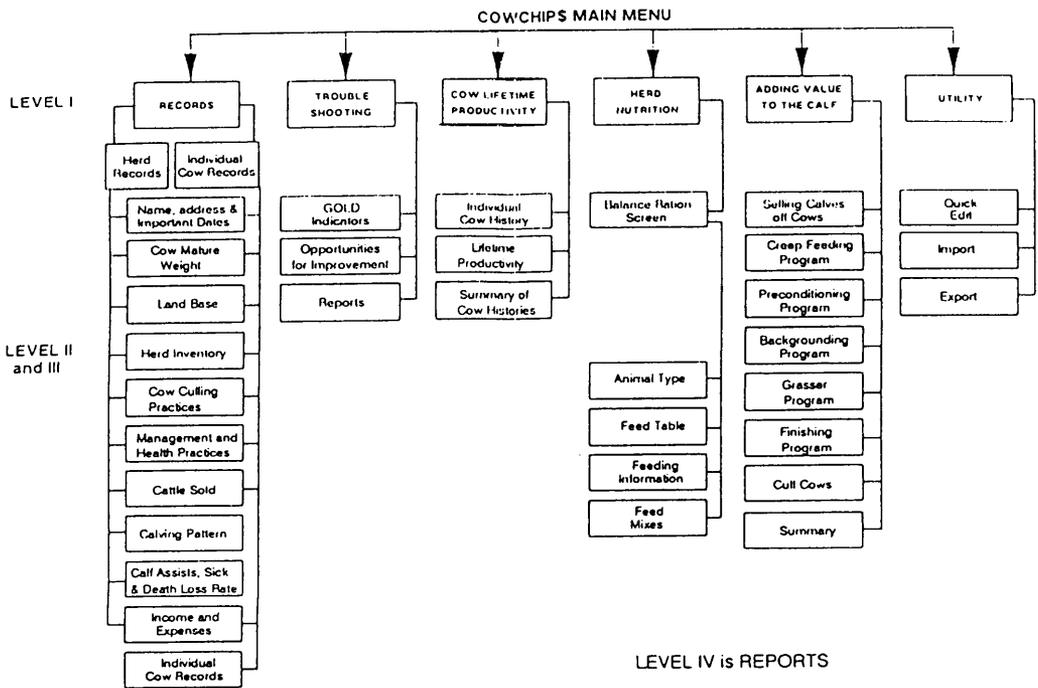


Figure 5

Data ; Cowchips, A Beef Herd Management Program. Alberta Agriculture, Food and Rural Development Brochure.

season, and Death loss of calves) used as production management guidelines are compared with district, regional or provincial values and industry benchmarks as shown by the sample reports in appendix 2. This module also evaluates these indicators for strengths and weaknesses and identifies opportunities for improvement. Reports can be generated giving summaries of head and individual animal performance.

### **C) Cow Lifetime Productivity**

This module combines individual cow record files from previous years and calculates the most probable producing ability values for lifetime productivity and biological efficiency for each cow.

### **D) Herd Nutrition**

This module provides you with a quick method for balancing and checking beef rations. It calculates the nutrient values of the ration based on the amount of each feed ingredient selected. Nutrient requirements for the type of animal are identified. Feed ingredients to be used in the ration are selected from a list of feeds available in Alberta. Using basic feed consumption guidelines of cattle, the operator can determine the amounts of required feedstuffs to meet the animals' requirements at the lowest cost.

Within the parameters of the module, feed analysis information can be entered overriding default nutrient values. Feed stuffs unique to a farm manager's operation that are not contained in the data base can be added to the list of available feedstuffs. For example, if beet pulp is to be used as a source of roughage it can be added provided an analysis has been done to verify actual nutrient content. General default prices of feedstuffs are included so as to provide estimates of the cost of the ration when balanced. A help function is built in to assist when animal nutrition information is delete dash needed to build ration formulation.

### **E) Adding Value to the Calf (marketing)**

This module examines the feed costs per unit\* of weight gain, total cost per unit\* of weight gain, net return and break even price for various methods of adding value to the calf. \* unit means pound or kilogram.

### **F) Utility**

The utility module can be used for quick and easy editing of cow record files. Data can also be inputted and ASCII files as well can be imported and exported.

## **Information and Education on the "Electronic Highway"**

A major focus for government, private consulting groups and agriculture colleges and universities is farm business management. General farm production skills that were once the focus of extension education are now well-known. Computer use in basic farm business management, needed to improve farm production efficiency, are now gaining importance. There are many applications for computer use in farming with many more uses to be discovered.

Traditionally, beef farm managers would receive training at federal and provincial experiment stations or demonstration farms. Up to now, colleges and universities pro-

vided practical training through extension departments. To complement this, provincial agriculture departments have offered adult and professional development training. Methods of teaching are evolving from traditional classroom instructor based learning to electronic aided learning. Home study still often consists of printed material though there is a rapid change occurring in the direction of teleconferencing with an instructor. Computer-based learning can also be added to the growing choices of learning methodologies with lessons being downloaded to the course registrant's computers. Video is another important medium, where the learner can study at his own pace. Currently, provincial government district and regional offices have a well organized system of print media and training video libraries that beef farm managers can access. Currently there is no charge for borrowing video tapes or acquiring most printed materials.

Provincial agriculture specialists still conduct one-on-one planning meetings with farm managers to organize relevant educational training to suit local needs. Their job, with college educators, makes up the bulk of the technology transfer occurring in Canadian agriculture today. As they compete with private companies and knowledgeable producers who are supplying information services, it is increasingly important that the traditional service providers keep up with advancements in computer-aided learning to continue to deliver an effective service.

As mentioned earlier, BBS's will be used to offer training to beef farm managers. A number of educational and private industry representatives are now forming groups to develop strategies to use the BBS to train farm managers. BBS's and distant education courses will become more and more important. As operating budgets continue to be reduced, it will be necessary to deliver such services in a timely and cost effective manner. With educational institutions, private industries, and governments continuing to develop and emphasize on-line training through a BBS, there is a risk that limited resources could be overwhelmed. For this reason, it is crucial that when planning such services, groups or organizations remain focused on addressing an educational need.

Up to now, beef managers and computer based on-line learning services have been presented from a Canadian or Alberta perspective. Taking this information one step further, it can readily be applied to circumstances and situations in Japan. Although marketing options, production methods, and government agriculture policies differ between Japan and Alberta, there is an underlying common goal among producers in both countries; that is, to be more independent, competitive and profitable. In Alberta, beef farm managers are accessing marketing data, analysed information, and current weather reports. This allows them to either sell or purchase feed and equipment, use U. S. A. and world production reports, access weather forecasts, as well as advice and education from private and public sources.

In contrast, most information systems in Japan are only managing and integrating weather and production records at present with commentary from the organization operating the system. This is evident in the Tokachi Nokyouren Jouhou system based in Hokkaido, Japan. Some aspects of the expanded North American style of individual and collective marketing and farm management could be adapted in Japan as production efficiency becomes more important due to freer trade.

Whether in Alberta or Hokkaido, potential problems such as who has the rights over

managing and controlling information may be an issue as the private sector, educational institutions and governments are vying with each other to stake their territory in a yet to be defined area of education. The clear winner will be the beef manager if he can develop the skills to determine which information will benefit his farm business the most.

### Conclusion

The challenge is for beef managers to take advantage of the rapidly developing area of computer use and to diversify their products and improve their marketing skills and management for the next century. Growing international trade is forcing beef farm managers to not only continuously challenge their already efficient methods of production, but to expand their knowledge and information about farming situations beyond their immediate locales. Computer training and information technology, that consists of computer software, satellite information services and computer networks, is currently the best way for beef farm managers to ensure they remain fully knowledgeable and competitive in national and international forums. These services and the situations beef farm managers find themselves a part of can easily be extrapolated from the local Alberta experience into the international realm by transference to Hokkaido, Japan.

Hokkaido farmers can also easily benefit from this rapidly growing area of computer technology as markets in Japan continue to open up. Competition with foreign products will continue to increase, making it more difficult to operate profitably. By taking advantage of computer use to further improve beef farm management and to compare international marketing and production information, Hokkaido farm managers can find opportunities to remain competitive.

### Appendix

- 1) *Farm Business Management Initiative*. 1993/1994 Annual Report. Table 5 9.2 to 9.4 pp. 19 to 26.
- 2) *Production Efficiency Reprts.* January, 4, 1994. COWCHPS program. MPWUAL.

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### 要 約

本稿は、アルバータ州における牛群管理のコンピューター使用に関して考察したものである。具体的には、カナダ・アルバータにおけるコンピューターソフトウェア、衛星情報サービス、コンピューターネットワークによる、アクセス用の器具を含む様々な情報は、牛群管理にどのような重要な役割と意義をもっているものなのかを検討したものである。つまり、農業経営管理のソフトウェアは、農業経営者に効果的な生産活動や、商品目録を探すのを容易にさせる。また、衛星情報サービスは正確な生産や市場決定を下すのに国内外の情報を提供している。さらにコンピューターネットワークは、多くの熟練使用者からの豊富な情報が提供されるものである。

これらのユニークな情報源は、国の部門や設備、私営の会社・企業、教育機関等の果たす重要な役割を理解するに大きな効果をもたらすであろう。農業経営者の情報を利用する能力は、これらの機関による適切でタイムリーなトレーニングによって高められるものが多い。ファーム・ビジネス・マゲジメント・イニシアティブ (FBMI) は拡張されたトレーニングコースを創るために、利害関係を含まない私営産業や教育機関と産業リーダーや国の専門家を寄せ集めるのに大きい役割を果たしている。FBMIはその機関だけでなく、農業経営者にとっても有意義な情報を提供するために様々なグループが協力し合っていて活動している好実例である。その中心的な目的は、農業者にコンピューターをもっと効果的に使うことで農業経営の基本的な理解を促すことにある。

最新の情報に通じるものとしての肉牛生産者は、農業経営を理解し改善するためにコンピューターを使用する必要がある。つまり、コンピューターを通じての情報を認識し受け入れることを続けていかなければならない。本稿では、現在の北海道と、カナダ・アルバータの農業経営者などが必要な事柄などの情報をどのように使用しているのか、その使用システムを比較検討することも課題として整理している。畜産管理におけるコンピューター使用は、過去にあまり注目されず、またこの分野での新しい研究も少なく、資料も限られている。ゆえに本稿の考察は、農業経営者や教育者、国の専門家、そして私的企業の熟練者にとっても有益な情報を与えるものになると考えられる。