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December 1998

THE MANAGEMENT CHALLENGE FACING THE ONTARIO RATITE INDUSTRY

by

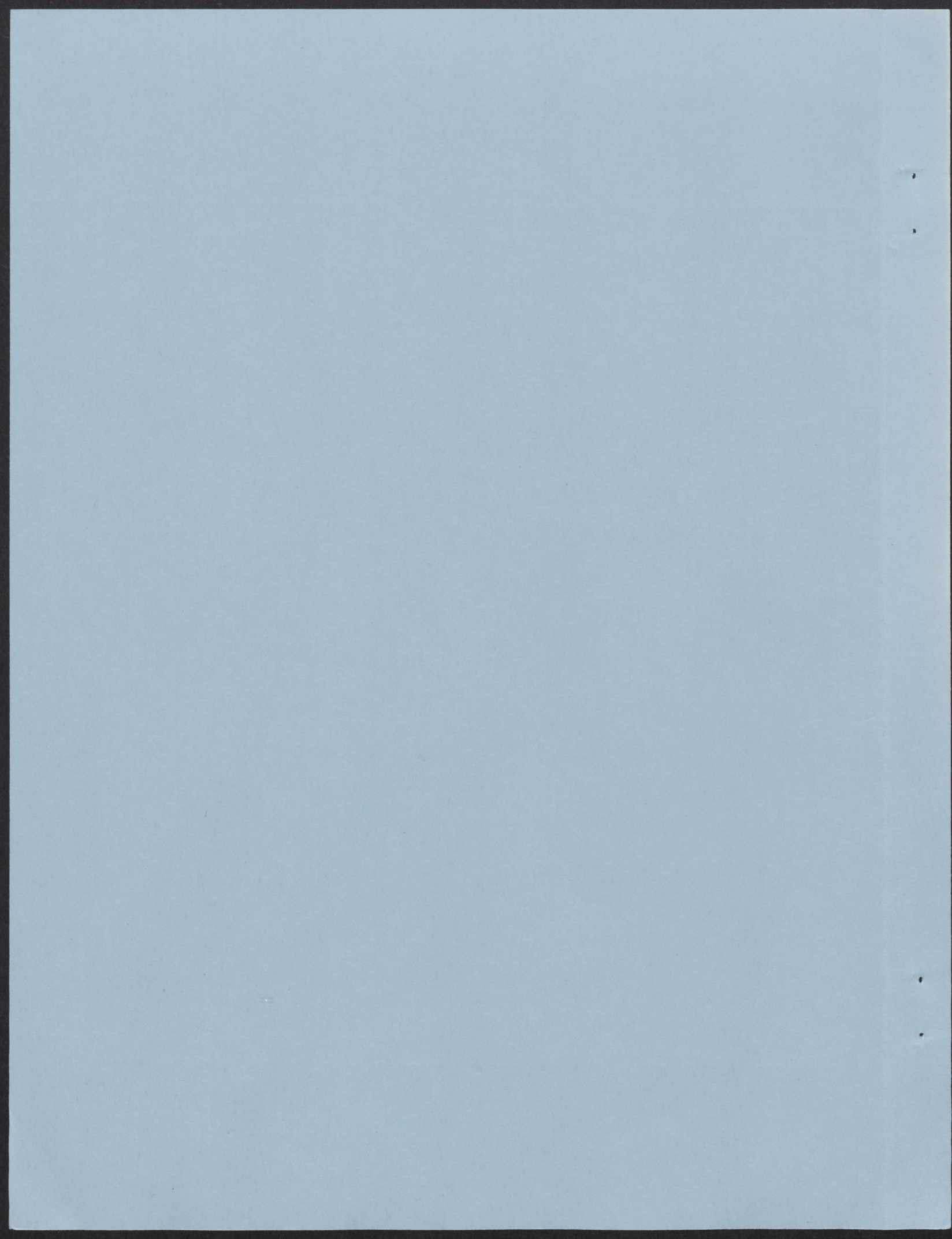
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Abstract

[This report provides an overview of the current economic conditions facing the Ontario ratite industry, the chronology of economic developments, which led up to the current situation and some possible solutions for future market development.

The Ontario ratite industry is comprised primarily of emu, and was started in 1989. From that date most of the economics was driven by the breeder market, with prices for breeding pairs exceeding \$40,000 at one time. In 1995 the so-called 'breeder bubble' burst and the price for breeder birds is approximately \$100-\$400 today. The burst of the breeder bubble caused some economic loss to some producers, but it also caused the industry to recognize that despite the euphoric demand for breeder pairs there was little effort to define an end-user market and open up distribution channels. The marketing cooperative CEMU was established but it too flounders in the wake of ill defined consumer demand for both meat products and oil.

With low demand, prices for consumer products have fallen. Premium pricing to beef has not generally worked, and the evidence in this report suggests that price, not health, is the primary influence over meat products, and emu or other ratite meat is no exception. As low demand causes prices to fall, the profitability to ratite producers has also fallen. This report suggests that producers will require at least \$4.59-\$6.60 per lbs of meat produced in order to break-even. The breakeven prices suggest that an emu operation cannot be sustained by producing meat alone or oil alone, but must focus production on both (and other) products. Because both meat and oil are so critical to the survival of the industry, while the ability of individual producers to effectively market both simultaneously is limited, it is recommended that CEMU be supported as a central marketing agency to develop and market products on behalf of producers. However, it is also recognized that there is a great deal of acrimony within the industry in this regard and a meeting of minds must be established before a central agency can be established.

The public policy issue in regards to the ratite industry does not necessarily deal with the provision of safety nets, but rather the facilitation of product assessment and market development. While this report describes the industry and makes suggestions for moving the industry forward, it does not deal specifically with the strategic issues facing a new industry. In a second report to be submitted a strategic paradigm for the development of new products frames the possible actions that OMAFRA and other public agencies can take to mitigate risk and maximize the probability of success. In the context of the current report which blames current economic conditions on the emergence of a highly speculative breeder market, with an ill-defined concept of end-user demand, the strategic paradigm would have required a resolute definition of products and target market before any instance of new product/market development would take place.

Table of Content

Introduction	Page 1 of 35
Background	Page 2 of 35
The Development of the Ratite/Emu Industry	Page 2 of 35
The Economic Problem	Page 6 of 35
Industry Overview	Page 6 of 35
The Breeder Bubble	Page 7 of 35
The Wholesale-Retail Market for Emu Products	Page 11 of 35
The Production Economics of Emu	Page 11 of 35
The Demand for Emu Products	Page 19 of 35
The Consumption Attributes of Emu Meat	Page 19 of 35
Price Discovery and the Demand for Emu Meat	Page 24 of 35
Implications of Meat Demand for the Emu Market	Page 28 of 35
An Overview of the Market for Emu Oil in Ontario	Page 30 of 35
Emu Oil Product Lines	Page 30 of 35
Marketing Channels	Page 31 of 35
Conclusions, Lessons Learned, and Policy Implications	Page 32 of 35
Appendix 1.0: Survey Respondents	Page 34 of 35

Introduction

With expectations of increasing farm income and assets returns over 300 Ontario farmers have switched production from conventional livestock into ratites. Ratites include ostriches, emus and rhea, and the expectation was that certain attributes of meat and fat could compete at a premium with conventional white and red meats. As niche market products, the ratites provided a healthy alternative for meats and oils which would suggest a substantial market premium over competing products.

With such expectations many producers invested upwards of \$30,000 to purchase breeding stock, and others moved out of conventional animal production and reconstructed barns and purchased specialized equipment to raise the birds. Unfortunately the industry, made primarily of emus in Ontario, has been unable to recover the investment or even adequately cash flow the enterprise. Assuming an average investment of \$40,000 per producer the investment costs are likely in excess of \$12,000,000 in Ontario. If cashflow lost from profitable enterprises forgone to raise ratites is considered the investment opportunity cost could well exceed \$25,000,000. Cash flow shortages and the prospect of significant losses could provide significant hardship for this group of producers and the industry might need some form of public assistance to manage supply or develop new marketing outlets.

To date most emus were expected to be marketed through the Canadian Emu Cooperative (CEMU) but CEMU has been unable to expand distribution into conventional retail distribution. Emu producers are either selling meat directly from the on-farm business or creating distribution channels for themselves. None the less, CEMU still holds over \$500,000 of inventory in freezers but a good proportion of this could be lost to freezer burn. CEMU is also restricting its acceptance of new birds for slaughter in order to reduce its cooperative inventory, and farmers who's birds are held in inventory are not being paid to cover costs. In addition, new uses products such as emu oil, which has some documented health benefits, may not gain sufficient market demand in the short-run to alleviate the problems, and in the long run, labeling laws imposed by Health Canada may restrict any health claims that are not supported by scientifically documented research.

The objective of this report is to investigate the economics of the Ontario ratite industry with the aim of providing constructive assistance to the industry. The base case will be emu as this group appears to make up the largest volume of marketed ratites in Ontario. To do this the research will include discussions with industry representatives in Ontario and Alberta (see appendix A1), review prior research conducted in the U.S.A., and have meetings with OMAFRA representatives. The supply chain involved in the production, processing, distribution, and consumption of ratite products will be evaluated (with the primary focus on emus). An analysis of production combined with demand estimates for beef, pork, chicken and turkey will provide an estimate of the range of prices over which price discovery must take place, at least in the meat market, for a successful retail market for meat to emerge. The role of oil will also be discussed in this context.

The market for emus as a breeding industry, retail meat industry, and oil industry represents an excellent opportunity to discuss the broader issues relating to strategic marketing

initiatives for new products and new uses products. While this report assesses the chronology of market development, and assesses the economics thereof, it provides only part of the problem facing the industry and new industries. The other part of the problem is the establishment of a strategic paradigm which can assist market makers, entrepreneurs, and public consultants so that they, as a group, can strategically direct the development of a new market. Consequently a second report, prepared by Sparling, Turvey, and VanDuuren has been written. This second report frames a methodology which can be used to make assessments of new uses or new products before significant real economic resources are applied. Such a framework is critically important. As will be discussed in this report the entire ratite industry was based upon a breeder market and only recently did realizations of post-breeder market realizations become important. The framework we suggest in the second report would have identified, and indeed would have forced discussion about the end-user market for meat, oils, and other products well before the breeder bubble formed and broke.

To this end the following describe the specific objectives of this study

- ▶ To provide an overview of ratite meat and oil products.
- ▶ To provide a historical perspective on the Ontario Ratite industry
- ▶ To establish a supply-chain mapping of products from production to the end-user.
- ▶ To determine the breakeven market price of emu meat
- ▶ To determine the sustainability of the industry in terms of supply and demand and competitive market products.
- ▶ To evaluate various alternatives to direct the Ontario industry towards sustainability or exit.

Background

In this section the historical development of the emu industry is presented first as a chronology of events and changing industry structure, and then in terms of the economic problems and issues facing the industry. This review provides a sense of structural and strategic economic issues facing the industry at this time.

The Development of the Ratite/Emu Industry

The following table 1 tabulates the emergence of the emu industry, starting with the entry of Crosshill Farms and Hunters in 1989, and up to the collapse of the market in 1995. In addition the table summarizes the status of the industry in Alberta as a point of comparison. The table reveals that the industry life cycle was very short, with slow entry, very rapid growth, maturation within 3 years, and a rapid decline within 5 years. Such a life cycle would commonly depict a bubble or fad industry, and is a remarkable departure from the usual life cycle found in other industries which reach maturation at a far later date.

Table 1: Qualitative Review of Ontario Emu Industry 1989- 1998				
Parameters	Ontario 1989 - 1990	Ontario 1991 -1993	Ontario 1994 - 1995	Alberta Review
Emu Industry Development	Two farms enter industry: Crosshill & Hunters	Continued growth of original breeder farms. Emergence of speculative hobbyist.	Continued attraction of hobbyist and committed producer; exiting of speculative hobbyist (late 1995-1998) Cash flow issues. Value added aspects of emu.	Paralleled Ontario industry development but with an 18 - 24 month time lag.
Rational for Entry	Agricultural diversification; A need to experiment; A desire to increase animal husbandry practices; and a need to add excitement to agriculture.	Attraction of more breeders due to momentum built by original entrants. Hobbyist viewed emu as secondary income supplementation. No entry barriers to emu farming.	Mirrored Ontario's producer's attractions.	
Growth	Slow, few producers enter industry.	Beginning of rapid growth. Many producers are entering industry.	Slowed growth of emu producers after breeder market collapse 1995. Continued slow growth to 1998	With the time lag in industry development, producers from Ontario and the US have been criticized for dumping birds in province in 1996.
Producer Attraction	Emu provides a tremendous opportunity for value added products; de-commoditization of agriculture; Demographics; Environmental trend beginning; Health Issues	Some emphasis on value added products by converted farmers/producers. speculative (hobbyist) primary attraction is aligned with pyramid breeding program. (\$\$\$). Little emphasis in value added products.	Access to cheap birds in speculation of oil and meat market development. Some experimentation in cheap animal husbandry access for oil and meat processing initiatives.	Diversification of agriculture; excess facilities; excess income; and encouragement to experiment in non-traditional forms of agriculture. Development of own feeding programs. (successfully lowering input costs)

Table 1: Qualitative Review of Ontario Emu Industry 1989- 1998

<i>Parameters</i>	<i>Ontario 1989 - 1990</i>	<i>Ontario 1991 -1993</i>	<i>Ontario 1994 - 1995</i>	<i>Alberta Review</i>
Media Messages	Promotion came from vacationing in Southern U.S., visits to exotic zoos and farm tours. Little general media attention.	Printed and voice media appear highlighting potential of industry and ease of entry into industry. Little interest centered around value added product markets. (potential product uses, success stories.)	Consumer applicability of value added products; slackening of new producer encouragement; Bad news stories; and questions about industry development.	Initially followed Ontario lead but encountered resistance from beef industry. then primary highlighting health benefits of emu products.
Emu Sourcing	Southern US, Texas, Oklahoma, Florida, Louisiana; and some exotic farm/zoos	Emergence of Ontario breeding industry. Continuance of emu's arriving from US sources	As price dropped all birds sourced in Ontario. US imports stopped.	Originally accessed birds from Ontario, and US until breeding industry died. Now primarily from Alberta.
Industry Development Emphasis	To introduce breeding industry, seek independence in Canada	Continued emphasis in breeding industry. Beginnings of meat and oil product markets. Establishment of the ORA (access to birds). Entry of input industry competitors - high priced feeds, equipment. .etc.	Concentration on value added aspects of emu; emergence of CEMU and subsequent retail trials; some export now being completed in breeding stock. Access to federal and EU processing facilities.	As the time lag between Ontario caused certain disturbances in industry, Associations were formed and a cooperative established but to little success. Currently, a \$5 million facility being developed privately to process alternative livestock in central Alberta. (EU and Fed. approved)
Type of Markets	Farmgate sales only	Mostly Farmgate; small experiments in retail chains and independents.	Independent retail development for value added products.	Currently, retails and farmgate sales. Some movement into tourism industry.

Table 1: Qualitative Review of Ontario Emu Industry 1989- 1998

<i>Parameters</i>	<i>Ontario 1989 - 1990</i>	<i>Ontario 1991 -1993</i>	<i>Ontario 1994 - 1995</i>	<i>Alberta Review</i>
Stated Government Role	Access to veterinary care	Continued veterinary access; little support in market development and product development. Some assistance in packaging but most self developed.	Support and facilitate industry organizations; Some involvement in animal husbandry; some action emu definition; and encourage of business plan development and not cash flow analysis.	Originally mirrored Ontario initiatives but now is making large effort in marketing/exporting; Involvement with Agriculture Canada research group on carcass and feeding programs.

The Economic Problem

Ontario's 300 emu/ratite farmers have been unable to establish new distribution channels and markets for their meat and oil products. An excess supply of growing birds and frozen inventory has caused market prices to decrease rapidly in recent years. Each emu for example would receive less than \$120 for the meat and \$70 for the fat. Typically the price of emu meat is over 2 times the price of beef at the wholesale level which implies that it would be in excess of 2 times the price at the retail level. The cooperative CEMU has been unable to persuade consumers that emu meat is exotic enough or healthy enough to warrant such a price premium, and consequently the demand is low with a marginal rate of substitution with other meats close to zero. While one would expect that consumer interest would increase at lower price breaking points it is unknown whether such a price would be sufficient to cover costs of production and provide a reasonable return on equity or at least allow some producers to exit the industry at the lowest possible cost.

There are several economic issues here. The first issue is related to the historical perspective of the industry and what expectations were used to motivate expansion into ratites in the first place. From this basis there is a need to determine whether the investments were speculative in nature or whether there was a genuine belief that a market would emerge; and if so was this done without the foresight that too many entrants would cause an excess supply over (real or perceived) demand. This analysis will provide a further background to what the industry is experiencing to date.

The second issue is the current economic situation facing producers, CEMU, and other industry stakeholders.

Industry Overview

The industry overview is developed in several sections. First the industry is described qualitatively in terms of the Ontario and Alberta markets. Next, the economic issues are presented. There are three issues of concern. These are;

1. the breeder bubble,
2. Costs of production and scale and size efficiencies
3. The demand for meats and other ratite products.

The Breeder Bubble

We will refer to the breeder bubble as the ubiquitous rise and fall in the emu breeder market. Our data, gathered from Ontario producers, breeders, and elsewhere is consistent with data from the United States. The breeder market is characterized by mature 2-year old breeding pairs, 1 year old yearlings, and chicks. When the breeder market emerged the end-user appeared to be other breeders rather than end-user consumers of final products. In the emu market, unlike

Emu Prices for Birds

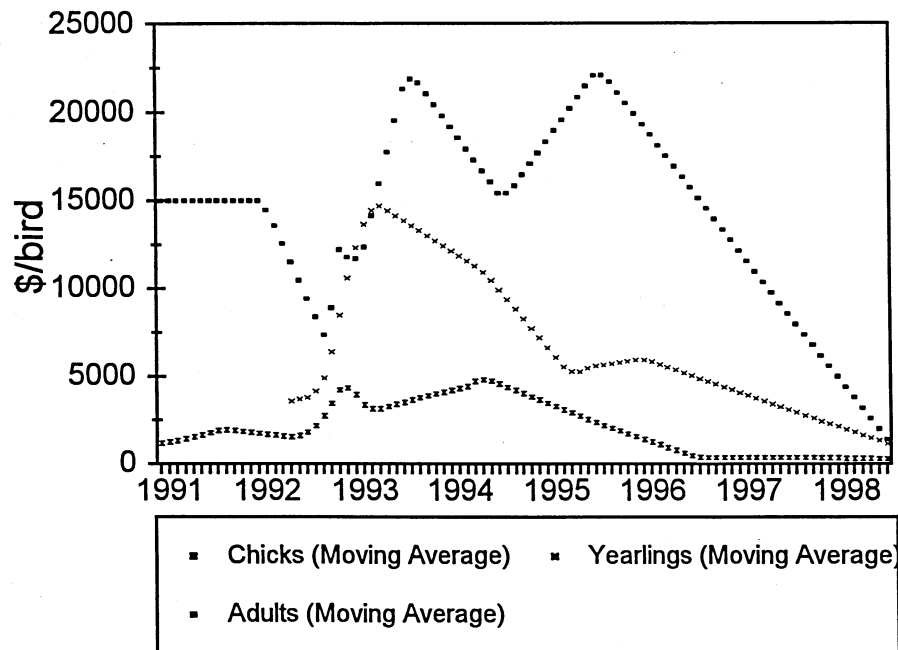


Figure 1 Market pricing of breeder emu's 1991-1998

ostriches and rhea, breeding pairs are monogamous, and so the market was generally for breeding pairs rather than single hens or roosters. However a yearling and chick market did emerge which allowed the selling of differently sexed stocks without mature mates.

The price of an imported emu (hen or rooster) in 1990/91 was approximately \$15,000. In 1991/92 the market for chicks (and eggs) emerged and the value of chicks increased in a corresponding pattern to mature breeding animals, albeit at a discounted price. In 1992/1993 the yearling market emerged for the first offspring from the original breeding pair purchased. Throughout this period the breeder market developed rapidly and was very speculative in nature. By 1994 through 1996 the price for breeding pairs was in excess of \$40,000. During 1995/1996 there was a rapid decline in the prices. In figure 1 we have smoothed this decline in prices and our

figure indicates a rate of decline which was substantially slower than some breeders might have observed. Indeed, on October 28 th 1998 during a presentation to the Ontario Ratite Association a breeder challenged our smoothing and argued that his experience was much closer to the precipitous decline in the U.S. market (figure 2.).

Comparison of Emu Breeding Pair Prices Canada and the United States

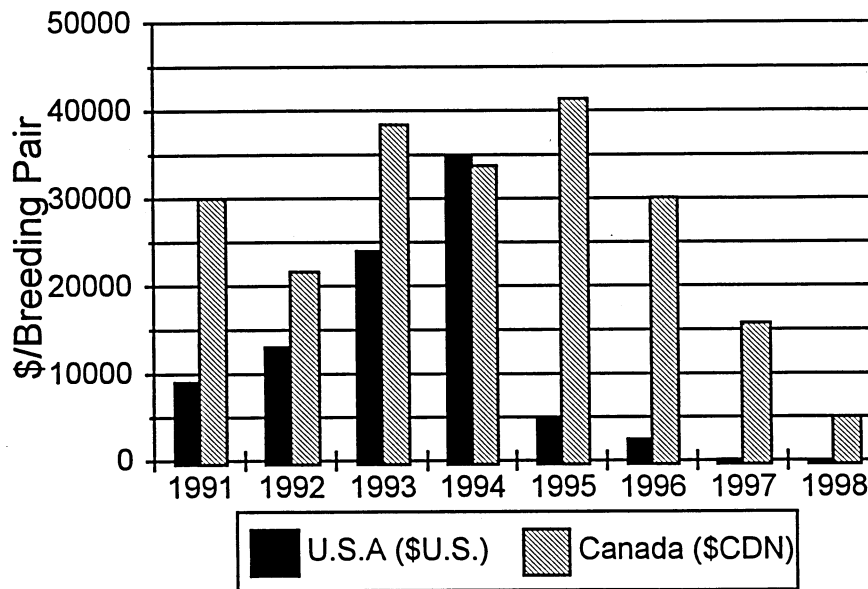


Figure 2: prices of breeding pairs Canada and the U.S.A. 1991 through 1998

There are several reasons for the rapid decline of the breeder market. First the breeder bubble was caused by excessive speculation in the forward prices of breeder pairs. It is a speculative bubble because there is no early indication of an end user market which could actually be used to discover prices in the breeder market. For example in the dairy, beef, or hog sectors the market price for breeding cows and sows is determined by the meat or dairy quality of the progeny with the meat and dairy products being the end user product. In 1990 through 1996 there was no defined market for emu products at the retail level or as a specialty meats, and the first studies on the retail value of meats did not appear until 1995 and 1996 in Louisiana and Texas, and more recently in Alberta.

There is a critical lesson to be learned about speculation not only in this agricultural product but in new use products in general. The first is an examination of the biological growth

rate in the flocks which should have sent an early signal that the supply of birds in the breeder market was increasing at an increasing rate. Table 2 shows the population growth from a single hen providing 6, 7, 8, 9, and 10 breeding pairs into the market. The table shows an exponential rise in the population such that a single breeding pair could result in a total population of 133 pairs within 5 years if the survival rate is 12 chicks/year (10 breeding pairs) and 341 if the survival rate is 20 chicks. After 10 years the compounding effect results in a population of 35,839 when 6 pairs per year survive and 287,891 when 10 pairs survive. It is important to reemphasize that this is from a single breeding pair. Although we were unable to come up with an estimate of how many breeding pairs were in Ontario in 1990 it is important to note that if the number were 100 the breeding population for an 8-pair survival rate would suggest a population of 22,500 by 1995, and if 1,000 breeding pairs existed the Ontario population would swell from 1,000 in 1990 to 225,000 in 1995. What is important here is the pattern of growth, and recalling that the industry did not become popular until the late 1980's in the U.S. and the early 1990's in Canada. It is not surprising that due to the prolific reproduction rates of emus that an oversupply would burst the breeder bubble by about 1995.

<i>period</i>	<i>Breeding Pairs Born per Year</i>				
	6	7	8	9	10
0	1	1	1	1	1
1	1	1	1	1	1
2	7	8	9	10	11
3	13	15	17	19	21
4	55	71	89	109	131
5	133	176	225	280	341
6	463	673	937	1,261	1,651
7	1,261	1,905	2,737	3,781	5,061
8	4,039	6,616	10,233	15,130	21,571
9	11,605	19,951	32,129	49,159	72,181
10	35,839	66,263	113,993	185,329	287,891

The second bubble indicator points to the speculative demand for emus. In a later section of this report we show that the average total costs of a 15 hen emu operation is approximately \$2,400 per bird per year with certain allocations for overhead and so on. Based on this value it is possible to get a sense of what breeder buyers were expecting in terms of future cash flows from the emu market. This is illustrated in Table 3 for a \$40,000 investment in a breeding pair (circa 1994-1995), assuming a 25% tax rate and an after-tax risk adjusted discount rate of 10%. Depending upon the holding period of the breeding pair and assuming that all (15) offspring are sold as yearlings the

after tax costs is \$1,823, and the present value of this cost is approximately \$6,900, \$11,200, and \$13,800 for holding periods (investment horizons) of 5, 10, and 15 years respectively. The difference between the initial investment and these present value costs represents the anticipated benefit which must have been expected to rationalize the investment at the break-even level. Consequently the present value of benefits would have to be at least \$33,000, \$28,000, and \$26,000 respectively. A useful way of summarizing this is to compute the annuity value of these benefits. On an annualized basis breeders must have anticipated at least \$8,700 for each of 5 years or \$4,300 for each of 15 years. Dividing this number through by 15 yearlings gives an estimate of what the value of each yearling would minimally be worth. These are dependent on the time horizon used in the investment but it would be reasonable to assume that breeders expected somewhere in the neighborhood of \$290 and \$582 per yearling.

Table 3: Estimates of Speculative Value of Emu Breeding Pairs				
		<i>Holding Period (Years)</i>		
<i>Present Value Factors</i>		5	10	15
Costs	\$1,823			
Discount	10%			
PV	\$40,000			
PV Cost		\$6,909	\$11,198	\$13,862
PV Benefits		\$33,091	\$28,802	\$26,138
Annualized Benefits		\$8,729	\$5,385	\$4,351
Benefits per Yearling		\$582	\$359	\$290

It is our belief that the breeder bubble arose from these two critical factors. Future speculation on the value of offspring initially caused prices to rise, and as they rose new entrants perceived that the value must be real. This became a self fulfilling prophecy in the early years as the birds bred by the early adopters were purchased with increased and spiraling speculation by newer entrants. As the population of breeders grew so did the population of breeder stock. In fact the effect would have been compounding as the rate of new breeders increased, producing bird populations which were in themselves, and through nature, growing exponentially. It is not unreasonable that an oversupply of the birds within 5-7 years of the earliest adopters would cause the breeder bubble to burst. As the rate of new entrants slowed, and existing breeders were at capacity, there became little mobility in the market. As the realization of oversupply became clear the industry moved towards a breeder-wholesale market, but the infrastructure and marketing

channels for a wholesale-retail market had not been established and the anticipated returns were not realizable. The price of emus fell dramatically throughout 1995 and 1996 and the problem persists to this day.

The Wholesale-Retail Market for Emu Products

The burst of the breeder bubble was the first stage in a move towards the development of marketing channels and wholesale-retail distribution of emu meat, oil, and other products. It is unlikely that large dollar investments in breeder stock in the pre-1996 years are recoverable at this time, however this doesn't necessarily imply that a market for emu products cannot be realized. However, in order for such a market to be developed it is necessary to identify the market demand and supply forces which are going to define the market. One of the most important aspects of this is the price discovery process. The price discovery process failed in the breeder bubble because end-user demand was not explicitly considered. Indeed, it is apparent today that bubble was driven by a phantom demand for undefined products to be sold to consumers with unknown preferences. In part the phantom demand was based upon the apparent health attributes of emu oil and meat which is lower in fat and cholesterol than traditional meats, and perhaps heightened reports of super properties of emu oil.

In this section we attempt to evaluate the supply and demand conditions surrounding emu meat and oil. Most of the emphasis will be on meat demand, however it is impossible to evaluate the supply of meat without also considering the joint production of oil. In the first part we develop an enterprise budget for the emu enterprise and examine break-even prices above which emu products would be supplied. Next we investigate the demand for chicken, turkey, beef and pork in Canada and from this make some assertions which about consumer and wholesale-retail demand.

The Production Economics of Emu

The costs of production of emu in Ontario have not previously been computed. The data presented in this study are derived from a U.S. study by Gillespie, Schupp, and Taylor¹. In their study Gillespie et al used a variety of methods to investigate supply and demand. Their analysis of production and costs of production was obtained from a mail survey of 95 emu producers in Louisiana. They found that the most popular method of breeding was to have paired animals and the average sized operation was about 15 breeding pairs. The median number of eggs laid per hen was 23, the median number hatched was 13, and the median number surviving through 3 months was 11. This is similar to anecdotal evidence in Canada, except that the mean number of chicks

¹Gillespie, J., A. Schupp, and G. Taylor 1996, Economic Analysis of Slaughter Market Opportunities for the Ratite Industry in Louisiana, Department of Agricultural Economics and Agribusiness, Louisiana State University

surviving to 3 months would be about 15 in Canada.

Table 4 summarizes the assumptions used to determine costs. Most of these assumptions were obtained from Gillespie et al. In addition, since no cost of production studies are available for the current emu operation in Ontario it should be kept in mind that most of the cost values are based on 1996 U.S. prices. These U.S. prices were divided by .80 to convert them to a Canadian dollar equivalent. Furthermore, our cost estimates may be high due to various assumptions regarding investment costs in machinery, buildings, and equipment. In fact a 1997 study by Simba enterprises Ltd. for the Alberta Ministry of Agriculture indicates that the costs of production for raising emu to slaughter weight is about \$150-\$200 Canadian. However the Simba study does not provide a detailed breakdown of costs as we do . However, we do apply sensitivity analysis on feed costs and investment costs and provide a range of costs which are in the neighborhood of the Simba quote. Feed costs applied at various growth stages of yearling animals are presented in Table 4 (Gillespie et al).

Table 4: Assumptions Used in Calculating Emu Enterprise Returns				
Revenue Expense Item	Comment	Units	Quantity	Unit Price
Revenues	based on 23 eggs laid per hen, 13 eggs hatching, and 11 surviving through 3 months	birds	15.00	
Breeder	animals sold as breeders-yearlings	bird	0.00	\$50.00
Cull - meat	Slaughter meat-prime and stewing cuts-yearlings @ 35lbs/bird	lbs	35.00	\$4.00
Cull - oil	Oil from back fat removed at slaughter and then exported for rendering; 1lbs oil from 4lbs fat	quarts	4.50	\$26.00
Cull other	resale of hide feathers and other marketable by-products	units	0.00	\$0.00
EXPENSES				
Maintenance feed	Primarily for breeding stock on off-breeding periods June-Oct @ 2lbs/day for 152	cwt	6.08	\$22.00
Grower feed	special ration for 3 month old chicks and yearlings up to 18 months. Assumed at 1.644 lbs/day for 267 days	cwt	65.84	\$22.00
starter feed	special ration for chicks up to 14 weeks. Assumed at .531 lbs/day for 98 days	cwt	7.81	\$25.00
breeder feed	special ration for hens and rooster during breeding months (Nov. through May). 213 days assumed at 2lbs/day per bird	cwt	8.52	\$24.25
Herbicide-roundup	for weed control around pens	pints/hen	0.06	\$9.69
Feed pans		each	3.00	\$12.50

Table 4: Assumptions Used in Calculating Emu Enterprise Returns				
Revenue Expense Item	Comment	Units	Quantity	Unit Price
Utilities	Incremental costs for incubation, hatching, and air	\$/hen	1.00	\$531.25
Vet and Medicine-breeders	Body conditioning exam and injection of Ivomec	\$/hen	2.00	\$33.75
Vet and Medicine-offspring	Injection of Ivomec	injection	1.00	\$18.75
Nesting Sand	Used by rooster to make nest and as a source of grit	cubic yards	1.25	\$3.75
Disinfectant	cleaning and sanitizing hatchers and incubators	gallons	0.06	\$50.00
Diesel and Gasoline	Allocated costs marketing and field work	\$/hen	1.00	\$34.87
Repairs and maintenance	Allocated costs to new and old equipment and buildings	\$/hen	1.00	\$168.46
Interest on Operating capital	Based on 75% of variable expenses for 4 months	%	0.07	\$0.00
Fixed Expenses	based on 15 hen flock			
Machinery and Equipment	Based on original \$35,000 investment in equipment depreciated over 7 years with no salvage value and allocated 20% to enterprise.	\$/year	0.20	\$333.33
Emu Facility	Assumed \$52,000 cost for building, incubator, pens and fencing, depreciated straight line over 10 years	\$/year	1.00	\$346.67
Emu Hen	Breeding costs depreciated over 10 years	\$/year	1.00	\$63.97
Emu Rooster	Breeding costs depreciated over 10 years	\$/year	1.00	\$63.97
Water Tank and pump	Fixed costs and repair costs of tank and pump	\$/year	1.00	\$2.82

Revenue Expense Item	Comment	Units	Quantity	Unit Price
Creep Feeder	Original cost is \$388 depreciated over 10 years	\$/year	1.00	\$2.59

Age in Weeks	Feed Intake	Days	Total Feed per
0-6	0.25	42	10.5
6	0.5	14	7
8	0.73	14	10.22
10	0.87	28	24.36
14	1	28	28
18	1.3	28	36.4
22	1.62	28	45.36
26-52	1.8	182	327.6

The results for a 15 hen emu barn as presented in Table 4 can be summarized as follows;

1. The base case is for a single hen (breeding pair). Based on the sale of 4.5 quarts of oil (at \$26/quart) and 35 lbs of meat (at \$4.00/lbs) for 15 yearlings/hen, each hen can generate up to \$3,855 in revenues.
2. Variable costs or total direct expenses for hen are \$2,917 for a contribution margin of \$937. For a 15 hen operation the direct costs are \$43,760 and the contribution margin is \$14,079.
3. Fixed costs, including non-cash depreciation expenses to recover initial capital investment is approximately \$546 per hen, and the total costs are \$3,464. For a 15 hen operation, total fixed costs are \$8,200.
4. Net Income per hen is \$390.93 and \$5,879 for a 15 hen flock
5. Variable costs per yearling are \$194
6. Fixed costs per yearling are \$36
7. Total costs per yearling are \$231
8. The breakeven value of production (meat plus oil) per pound produced (35 lbs) is \$5.56/lbs to cover variable costs and \$6.60/lbs to cover total costs.
9. If feed costs can be reduced by 25% by feeding on-farm grains rather than special feed mixes, total variable costs can be reduced to \$36,147 from \$43,760, and profits increased to \$13,492 from \$5,878 for a 15 hen herd. Breakeven prices needed to cover variable costs decrease from \$5.56/lbs to \$4.59.
10. If fixed costs can be decreased by 25% variable costs for a 15 hen flock decrease from \$8,200 to \$6,150 and net income increases from \$5,879 to \$7,929.

11. If both fixed costs and feed costs can be reduced by 25% the total costs fall from a base of \$51,961 to \$42,297 and income increases from \$5,879 to \$15,542.

The enterprise budget shows profit potential when meat is sold for an average \$4/lbs and fat is rendered into oil. In reality, meat prices are highly variable and the process of price discovery has not yet taken place. In some instances where emu meat is not known or not properly targeted it is selling on par with beef at the retail level, while in other situations it is selling at 1.5 or more times the beef price. In addition not all farmers have the opportunity to render oil or sell the back fat so that it can be rendered, and prices in the oil market are also highly variable

What is important is that in order for profitability to be sustainable the emu farmer must regard the value of both meat and oil in the production marketing decision. If the emu is slaughtered only for its fat, net income falls to \$-1,709 per hen, and if it is slaughtered only for its meat, net income falls to \$-1,364.

The joint product is one which should be emphasized to all producers. Indeed in our discussions with farmers, those that are most successful have diversified across the meat and oil (and breeder) markets and are fully utilizing the animal resources available. CEMU's mandate is to market oil, meat and other products. Our results show that if at least \$6.60 per lbs of meat can be obtained from the sale of meat and oil, many farmers would be able to operate without a loss. However, the marketing of meat, oil and other products may spread many producers too thin in terms of management, which implies that there is an economic synergy for supporting a marketing cooperative such as CEMU. It is recommended that OMAFRA and OMAFRA programs be used to provide professional assistance to the marketing cooperative.

Table 6: Enterprise Budget and Sensitivity Analysis for Emu					
Revenue Expense Item	Base Case	15 hen	reduce feed by 25%	reduce fixed costs by 25%	reduce feed and fixed costs
Revenues	1.00	15.00	15.00	15.00	15.00
Breeder	0.00	0.00	0.00	0.00	0.00
Cull - meat	2100.00	31500.00	31500.00	31500.00	31500.00
Cull - oil	1755.00	26325.00	26325.00	26325.00	26325.00
Cull other	0.00	0.00	0.00	0.00	0.00
GROSS REVENUES	3855.00	57840.00	57840.00	57840.00	57840.00
EXPENSES					
Maintenance feed	133.76	2006.40	1504.80	2006.40	1504.80
Grower feed	1448.53	21727.93	16295.94	21727.93	16295.94
starter feed	195.14	2927.14	2195.35	2927.14	2195.35
breeder feed	206.61	3099.15	2324.36	3099.15	2324.36
Herbicide-roundup	0.61	9.08	9.08	9.08	9.08
Feed pans	37.50	562.50	562.50	562.50	562.50
Utilities	531.25	7968.75	7968.75	7968.75	7968.75
Vet and Medicine-breeders	67.50	1012.50	1012.50	1012.50	1012.50
Vet and Medicine-offspring	18.75	281.25	281.25	281.25	281.25
Nesting Sand	4.69	70.31	70.31	70.31	70.31
Disinfectant	3.20	48.00	48.00	48.00	48.00
Diesel and Gasoline	34.87	523.05	523.05	523.05	523.05
Repairs and maintenance	168.46	2526.94	2526.94	2526.94	2526.94
Interest on Operating capital	66.52	997.80	824.20	997.80	824.20
Total Direct Expenses	2917.39	43760.80	36147.04	43760.80	36147.04
Contribution margin	937.61	14079.20	21692.96	14079.20	21692.96
Fixed Expenses					
Machinery and Equipment	66.67	1000.00	1000.00	750.00	750.00
Emu Facility	346.67	5200.00	5200.00	3900.00	3900.00
Emu Hen	63.97	959.55	959.55	719.66	719.66
Emu Rooster	63.97	959.55	959.55	719.66	719.66
Water Tank and pump	2.82	42.31	42.31	31.73	31.73

Table 6: Enterprise Budget and Sensitivity Analysis for Emu					
Revenue Expense Item	Base Case	15 hen	reduce feed by 25%	reduce fixed costs by 25%	reduce feed and fixed costs
Creep Feeder	2.59	38.80	38.80	29.10	29.10
TOTAL FIXED COSTS	546.68	8200.21	8200.21	6150.16	6150.16
TOTAL COSTS	3464.07	51961.01	44347.25	49910.96	42297.20
NET INCOME	390.93	5878.99	13492.75	7929.04	15542.80
Variable cost per offspring	194.49	194.49	160.65	194.49	160.65
Fixed cost per offspring	36.45	36.45	36.45	27.33	27.33
Total Cost per offspring	230.94	230.94	197.10	221.83	187.99
break even to cover variable costs	5.56	5.56	4.59	5.56	4.59
break even to cover fixed costs	6.60	6.60	5.63	6.34	0.01

The Demand for Emu Products

In this section we discuss the demand side for emu products in general, and emu meat in particular. First an overview of the market is provided. This overview is based on our own consultations with producers and a review of research and consulting reports from Alberta, Saskatchewan, Louisiana, and Texas. We are unaware of any marketing research reports in Ontario, and note that the marketing research reports cited are all dated after the breeder bubble crash in 1995. The section is outlined as follows. First the consumption attributes of emu meat is presented, and then results from several consumer surveys are reported. This is followed by a summary of marketing research in other jurisdictions which assess the distribution potential (retail and restaurant) of meats. Finally, we conducted an economic assessment of the demand for chicken, turkey, beef, and pork in Canada and use these results to emphasize the critical role that price discovery plays when developing a new market for a seemingly competitive product.

The Consumption Attributes of Emu Meat

Much of the speculative component of the breeder bubble was based upon the health attributes of the meat and oil. In terms of meat it was noted that consumption of red meat was declining and the consumption of white meat was increasing. This pattern is shown in Figures 3 and 4 for chicken, turkey, beef and pork in Canada. The Y-axis represents per-capita consumption over the period 1979 to 1997. Beef consumption decreased from 63.7 to 49.2 kg, and pork consumption

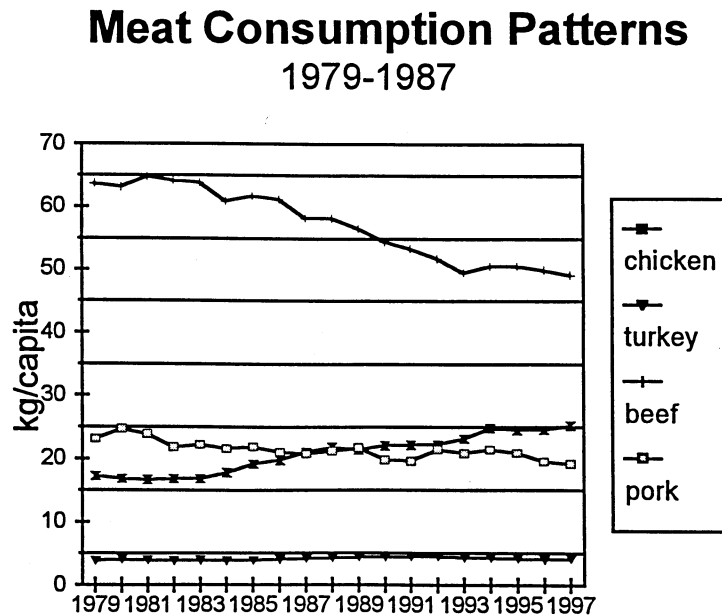


Figure 3: Meat Consumption Patterns

decreased from 23.18 to 19.18 kg, while chicken consumption increased from 17.27 to 25.25 kg and turkey consumption increased from 3.92 to 4.21 kg. As shown in Figure 4, which sums red meat consumption and white meat consumption there is a distinct decrease and increase in per capita consumption respectively.

Per Capita Consumption Red/White Me 1979-1997

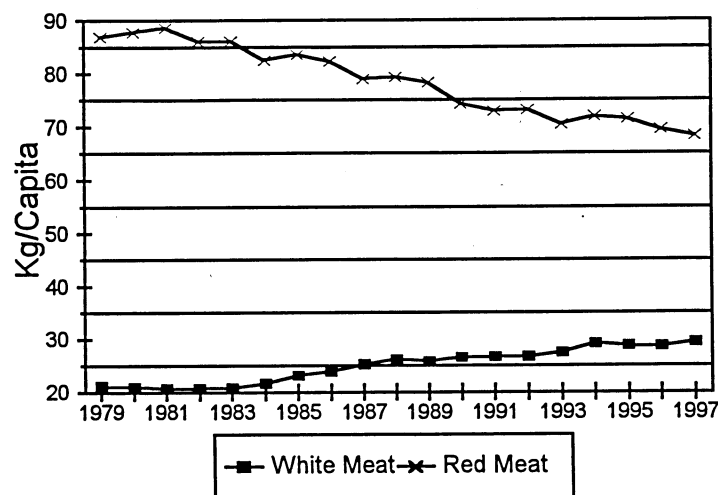


Figure 4: Comparison of red and white meat consumption

Table 7 identifies the nutrient composition of a 3 oz serving of emu meat in comparison to beef, pork, and chicken. Emu meat has a protein component comparable to the other meats but is significantly lower in fat, cholesterol, and calories. Whereas high protein is required to build human strength, numerous studies have identified fat, cholesterol, and calories to a number of health problems including coronary heart disease, hardening of arteries, and obesity. The move to a low fat-cholesterol-calory diet was viewed by many as a major structural shift in demand and this has been indicated as a major impetus to the development of the breeder market.

Measure	Emu	Chicken	Beef	Pork
Protein, g	22	27	22	24
Fat, g	2	3	15	19
Cholesterol, g	58	73	75	84
Calories	109	140	235	275

Source: Gillespie et al, page 34 as summarized from USDA, Nutritive Value of Foods and Silliker Laboratories of Texas. Based on 3 oz servings.

It was believed that this represented a move to a more health diet and as such emu meat could find a niche by advertising as a red meat with better-than-white meat properties. However, this view has been found to be unsatisfactory in the market research reports we reviewed. The major conclusions of the reports are summarized below.

- Consumer taste tests in Louisiana found fresh ground emu meat to be less lardy/waxy than ground beef, ground emu was less juicy than beef, and emu was equally as mealy as beef.
 1. After 2 months of storage the taste tests were repeated. Emu meat (ground) was less mealy, less beefy tasting, and more juicy than ground beef. Emu also had a significant off-flavour.
 2. After 4 months of storage, ground emu was more mealy, less beefy tasting, and equally as juicy as ground beef. Emu took on a liver-like/giblet flavour, and overall the quality of emu meat was statistically lower (albeit with a small absolute difference) than beef.
 3. After 6 months of storage there was no real differences between ground emu and ground beef except that emu was perceived to be less juicy.
 4. For emu fan filets compared to sirloin steak, fresh grills indicated that emu had less of a beefy flavour, and was more liver-like. Emu was more juicy than beef but equally as chewy. Overall, emu steaks were judged to be inferior to beef steaks. This conclusion was consistent for stored meats up to 6 months out.
 5. Although the taste tests in Louisiana showed that emu was statistically inferior to sirloin steak in many respects they note that the absolute differences in quality or perception are not large. However, the emu meats in the study were prepared by direction, and many consumers may originally treat emu meat as a steak filet and attempt to cook it to a brown colour.

6. In order to compete with beef the emu industry would have to ensure that any consumer purchase of emu ground or prime meat is supplied with instructions on how to prepare it. Any failure to cook the meat properly will result in consumer dissatisfaction and low repeat customers.
- In Louisiana a survey of retailers and restaurateurs found that the most favoured product for the retailer is a 6 oz filet at the lowest possible price, while the restaurateurs found that product form and quality are the most important attributes
 1. For the restaurant business product form made up 40.35% of rating score, Purchase price was 39.12%, portion size was 15.21%, and branding was only 5.32%.
 2. For the retailer, 51.83% of the rating score was based on price, 18.58% was attributed to product form, 15.31% was branding, and portion size was 14.28%
 3. The Louisiana results indicate that the restaurant and retail business require different product attributes. For the retailer, price is the main concern as it has to compete on shelf with other meat products. However, the restaurants are more concerned about conformity and quality at the right price. In other words, when marketing to a retailer she is more likely to ask the price and then examine the meat, whereas the restaurateur is more likely to evaluate the meat and then ask the price.
 4. Branding was not deemed to be that important, but it was not unimportant either. There may be an opportunity for certain producers or CEMU to brand the product. However the results also indicate that individual producers can develop their own distribution channels or can single-source supply at the correct price and quality.
 - A Texas study on the emu market focused on the value-added chain. Noting that specialty products such as emu jerky had high value added, they focused to a great extent on these type of products.
 1. Cull best cuts of meat, steaks and fillets and use lower quality meat for ground emu, sausage, and jerky. The authors suggest an emu sausage comprised of 70/30 or 80/20 mix of emu and pork and advertised as a low fat breakfast
 2. Standard cuts, size and terminology need to be developed.
 3. Non-premium cuts of emu should be processed into jerky products, however it was noted that the current processor price for jerky meats is about \$1 for turkey and other meats, and no higher than \$1.50 for specialty jerky. There is an interest in producing these goods as long as a consumer demand can be verified.
 4. Prime emu, or Kalaya, should be reserved for the high value-added restaurant business, of upscale demographic, as this group is willing to pay a significant market premium for the goods.
 5. For prime cuts such as Kalaya, promotion should focus on flavour then price.
 6. All indications indicate that health is not an issue in this market. The authors cite several cases such as goat meat or McDonald's Mclean burger for which advertising and promotion focused on health, and the products failed. Specialized marketing to

- weight clinics and physicians could create a demand for a health product but, in general, the consuming public is more interested in taste and price than health.
7. Health food stores did show an interest in selling emu products but only after consumer demand was verified. In other words there is little indication that health food stores will lead the retailing side of the meat. Supermarkets were more open to stocking emu meat but price is an issue, and there are fears of low inventory turnover at higher prices.
 8. The authors of the Texas report suggest that emu products should be introduced to upscale supermarkets.
 9. A consumer study of emu meat in Texas indicated that consumers had inaccurate knowledge of emu meat, implying that packaging should be informative as to content and cooking instructions.
 10. A survey of 250 consumers, 65% indicated that emu meat had a gamey flavour, however acceptance was high on flavour but low on tenderness (similar to Louisiana).
 11. Males, between the ages of 40 and 49 were the most accepting of emu meat, while females in general were less accepting.
 12. A Texas focus group found that emu jerky was the toughest, chewiest, and most palatable of all jerkies tested.
 13. The Texas study cites a series of four focus groups held by a consulting company called Business Insights. Focus group results indicated a marketing strategy which focused on the health attributes of the meat through a nationally branded product. Focus group results indicated low consumer awareness (e.g. is emu meat red or white?). They were also concerned about the price of emu meat and concluded that it would have to be priced competitively with other meat products. The consulting firm indicated that a substantial amount of advertising, promotion and/or public relations support would be needed to encourage consumer trial and repeat purchases.
 14. The Texas report did not agree with the Business Insights' conclusion that the health food market should be the primary target, and in citing a move by the beef producers to produce leaner beef, did not agree with a recommendation to price and compete in the beef market. Promotion and marketing strategy should focus on taste and price.

As evidenced by these studies there is some, but not an overwhelming, consistency in perceptions on how emu meat products should be marketed. Taste preferences do not appear to be identifiable or even consistent from region to region. The Louisiana study indicates a preference by young and low-income consumers for emu products, whereas the Texas study finds upscale men aged 40-49 as the ideal candidate. The breeder market which originated on the basis of health and nutrition still has some report from some groups, but the overwhelming evidence to date is that neither consumers, retailers, or restaurateur are willing to pay a substantial premium for emu meat

on the basis of health. Rather, the basis of value is taste and quality. This is not to imply that emu meats cannot retail at a premium, but does imply that the value added should not be a health premium but a taste and quality premium. Processors may be able to take advantage of such differentiated pricing, by selling premium or Kalaya cuts to restaurants and butcheries at a higher-than-beef price, while selling the lower cuts to be further processed into sausage or jerky. However there is one overriding caveat to this consumer market and that is the industry's ability to deliver quality and quantity of emu cuts in a timely fashion, and there is also a need to ensure that a standardized grading system is developed and accepted on a Canadian, if not North American scale. In fact, a recent report by PPD Technologies Inc. and the Saskatchewan Agri-Food Innovation Fund indicates that the greatest impediment to the development of an exotic food marketplace is the lack of industry infrastructure to develop marketing channels and the lack of production standards, weights and conformations.

There is in this a conundrum which may not easily be resolved in the short run. In Ontario CEMU has failed to deliver on distribution channels for meat and oil, which has resulted in a cottage industry comprised of many niche players. Each of the niche players competes at the farm-gate or for the processor-retailer-restaurant business, but this is done independently of obvious market signaling, and is highly inefficient in terms of the use of producers' human resources. On the other hand, the CEMU model is the one that is more likely to survive in the long run. An organization such as CEMU can negotiate on behalf of producers, source value added processing, offer consistent quality and supply, and blend prices such that the end-user price at least results in cost recovery at the producer level. However, it is clear that this aspect of the industry is fractious and the mandate of organizations such as the Ontario Ratite Association and CEMU are not converging. Until there is convergence in pricing and distribution it is unlikely that end-users will have the requisite confidence in the industry to create the demand required for price discovery and market-making.

Price Discovery and the Demand for Emu Meat

In this section we conduct an economic analysis of the Canadian Meat industry. Experience in other jurisdictions indicates that price is a critical factor in defining end-user demand, and our observation of the market place is that the price discovery function has not at all matured. The purpose of this section is to examine the relational demands for chicken, turkey, beef, and pork, and by examining aspects of this market place make inferences which will assist the Ontario (Canadian) emu industry to price products. Our analysis here is statistical but straight forward, and the primary intent is to discover the responsiveness of meat consumption to own prices and the prices of substitutes. In addition, a secondary goal is to determine if there has in fact been an incremental shift in consumer demand for these meat products which can be attributed to something other than price. In our opinion the estimates of the price effects will provide guidance as to the neighborhood of what prices will be competitive in the retail meat market, how consumption changes in response to price changes, and if factors other than price (e.g. health) can explain meat consumption patterns.

The data used include per capita consumption (kg/year) of chicken, turkey, beef, and pork in Canada, as well as the respective retail consumer price indices (1979=100) for the years 1979 to 1997. Although Ontario price indices could be obtained, these could not be matched to per capita consumption in Ontario. The price indices are graphed in figure 5.

Relative Price Changes in Meats 1979-1997

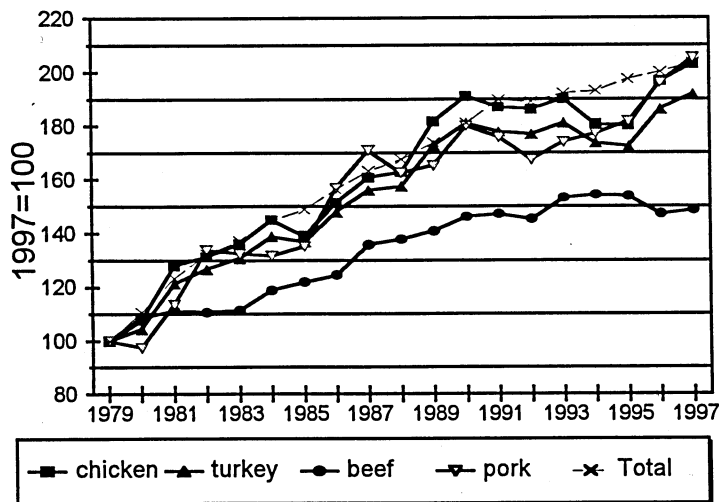


Figure 5: Price changes of major meats in Canada

Over the period 1979 to 1997 the CPI for all food products increased from a base of 100 to 226 or a 126% increase. The meat price index (shown in figure 5 as Total) increased at a lower rate than the overall CPI at 102%. Over the same period chicken prices increased by 98%, turkey by 102%, beef by 47% and pork by 105%. Corresponding to this is the consumption patterns identified in figures 3 and 4. One would think that with the beef CPI being so low that beef demand would have increased over this time period, but in demand analysis it is the change in relative prices in relationship to changes in the prices of competing or substitute products that matters.

To determine these relationships a series of ordinary least squares regressions were run. The first set of regressions were of the form

$$(1) C_i = a + b_{chk} P_{chk} + b_{trk} P_{trk} + b_{bf} P_{bf} + b_{prk} P_{prk} + c_i EXP + e_i$$

where the dependent variable C represents per capita consumption (kg/year) of each commodity, i; the subscript i represents a specific commodity (chicken, turkey, beef, or pork) and the subscripts chk, trk, bf, and prk represent chicken, turkey, beef, and pork respectively. The

variable EXP represents per capita expenditures on meat in real dollars (\$/year), and the term e_i represents the error. Collectively, these variables are hypothesized to explain much of the consumptive behaviour for meats. The b coefficients capture own and cross price effects; and the EXP variable proxies wealth effects.

A second equation was also run. This equation is given by

$$(2) C_i = a + b_{chk} P_{chk} + b_{trk} P_{trk} + b_{bf} P_{bf} + b_{prk} P_{prk} + c_i EXP + d_{1i} df1 + d_{2i} df2 + e_i$$

where the additional terms $df1$ and $df2$ represent dummy variables which capture structural change from 1985 to 1990 and 1990 to 1997 respectively. If the variables d_{1i} and d_{2i} are significantly different than zero this would indicate a change in consumption habits relative to the 1979-1985 period. In other words if there is a structural change due to factors other than price, this will be captured in this regression.

Results for the base regression in equation 1 are found in Table 8². The equations are fairly well behaved with all own price effects being negative. That is as expected, a price increase results in a decrease in quantity demanded. The * items indicate statistical significance at acceptable levels. Based on levels of significance the most influential variables are beef and pork. In fact, most of the changes in demand can be attributed to changes in the price of beef, which would indicate that there is a strong preference for beef. In fact as the price of beef increases (decreases) the quantity of chicken, turkey, and pork increases (decreases). As indicated in figure 5, the prices of chicken,

² The coefficients in Table 8 are interpreted relative to the index value. For example a 1 unit increase in the beef price index will increase the per capita demand for chicken by .158 kg/year. The demand flexibilities in the following table are obtained from the equation 1 coefficients. They indicate the percentage increase in demand given a 1% increase in prices. For example a 1% increase in the price of beef will result in a .82% increase in the demand for chicken. The first row and column in the table give the mean value of quantities consumed and price indices. The shaded area represents the demand flexibility matrix.

Demand Flexibilities from Linear Model					
	Quantity	Chicken	Turkey	Beef	Pork
Price		160.962	154.448	132.505	155.682
Chicken	20.763	-0.086	-0.517	0.816	0.547
Turkey	4.193	1.796	-1.780	0.458	-0.287
Beef	57.168	0.569	-0.606	-0.448	-0.047
Pork	21.424	2.660	-3.328	0.453	-0.258

turkey and pork are highly correlated. Consequently as one price increase or decreases so does the other, and consequently some negative coefficients are found in the regression estimates. Negative coefficients which are not own price effects indicate that the goods are complementary (e.g. chicken and turkey in the chicken demand equation) while positive coefficients indicate that the goods are substitutes. Complementary relationships may arise from price fixing behaviour in the supply managed industries.

The expenditure coefficients are negative for chicken and positive for turkey, beef, and pork but are not significant. For example, a \$1 increase in the meat expenditure budget will decrease chicken by .002 kg, whereas it will increase consumption of turkey, beef, and pork by .001, .02 and .0001 kg respectfully. Importantly the response in the beef demand equation to expenditure increases (which we assume is positively related to income) would indicate a strong preference for beef. In other words, the decreasing consumption of beef and pork is not necessarily due to life and quality issues but rather price and wealth effects.

Table 8: Least Square Estimates of Base Model (Eq. 1)

	Chicken	Turkey	Beef	Pork	Expenditure	R-square
Chicken	-0.029	-0.048	0.158*	0.072*	-0.002	0.950
Turkey	0.017	-0.012	0.018*	-0.009*	0.001	0.740
Beef	-0.180	0.247	-0.253*	-0.029	0.020	0.930
Pork	0.118	-0.171	0.071*	-0.043*	0.000	0.900

The demand equations for equation 2 are presented in Table 9. A similar pattern of own price effects, compliments and substitutes emerge from this model, with the exception that pork is an inferior good. What is significant in these regression are the coefficients on the structural dummy variables which are not significantly different from zero except in the pork equation. Relative to the actual consumption quantities for the 4 commodities these shifts are not at all significant. For example the results indicate an increase in beef consumption of 1.42 kg from 1985 to 1990 and a decrease of 2.8 kg in the 1990's, whereas chicken increased by .697 kg in the late 1980's and by 2kg in the 1990's.

The R-squared values which represent a goodness of fit do not increase substantially when these structural dummy variables are included in the model. The results show a strong disposition for consumers to make their meat consumption decisions based upon changes in the price of beef relative to other goods, and the evidence does not strongly indicate a significant structural shift in the consumption of beef or red meats in favour of white meats. The results of this analysis more strongly indicate that the demand for red and white meats is most heavily influenced by own and cross price effects.

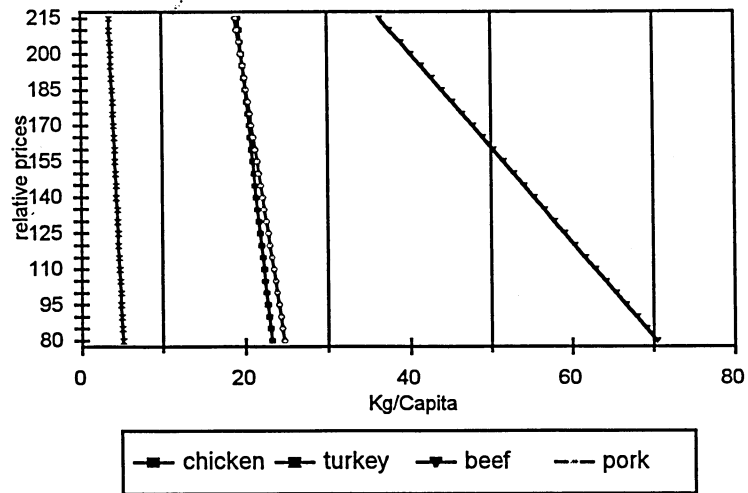
Summary	Chicken	Turkey	Beef	Pork	Expenditure	1985-1990	1991-1997	R-squared
Chicken	-0.011	-0.070	0.128*	0.073*	0.002	0.697	2.0	0.960
Turkey	0.047	-0.048	0.015	-0.008*	0.001	0.270	0.3	0.760
Beef	0.202	-0.224	-0.193	-0.017*	0.003	1.420	-2.8	0.960
Pork	0.354*	-0.462*	0.073*	-0.035*	-0.007*	1.525*	0.500	0.950

Implications of Meat Demand for the Emu Market

Understanding the demand economics of the Canadian market is important to understanding potential consumer response to emu meat. There are 3 significant points which should be considered in making an emu market.

1. The Canadian demand for meat is driven by prices. The studies in Louisiana and Texas both indicated that consumers at all levels of the food-supply chain were concerned about prices and this is evidenced by the demand analysis conducted here. For chicken, beef and pork, over 93% of changes in respective meat demands were explained by prices and only 1 or 2% was explained by attitudinal shifts. Although the effect of prices on Turkey demand was lower, this is likely due to autocorrelation with chicken prices than any structural variables. Even so, there is little evidence that structural change in the turkey market in Canada has occurred.
2. Related to point 1, the price influence is so strong that any attempt to mass market emu meat on factors other than price is doomed to fail. Canadian consumers are fairly entrenched in their consumption habits. Figure shows the 4 linear demand curves derived from the econometric model, These demand curves are based only on the systemic own price effects and other variables are evaluated at their mean values. Nonetheless the demand curves are quite revealing. Turkey demand is highly inelastic, and the consumption of turkey occurs over a very limited range regardless of price. Chicken and pork are slightly less inelastic and show more responsiveness to price, but even over the range of prices shown the consumption patterns do no change significantly. In contrast the beef demand function is more elastic and shows a significant response to prices over a wider range of consumption. While it may appear that beef has the most variable consumption pattern it is not vulnerable to new products such as emu meat and to target beef would be a mistake. The evidence

Per Capita Meat Demand Systematic Own Price Effects



from this study indicates that the most influential factor in determining the variability of consumer purchases is in fact the beef price.

An Overview of the Market for Emu Oil in Ontario

The Ontario emu oil industry emerged in part from the decrease in Canadian emu breeding pair prices. At this time, producers became aware that the economics of a breeding industry were not sufficient to cover their input costs and began to explore the value-added opportunity of refined emu oil products. It must be noted, that the early industry promoters (2 prominent Ontario producers) began the exploration of emu oil products in Ontario beginning in the early 1990's but did not develop significant marketing channels at that time.

During the winter of 1995-1996 and into the spring various emu producers began experimenting with the development of emu oil based products. At that time there was little in the way of knowledge in this sector in Ontario but the US had began emu oil development 24 months prior to Ontario's development. As witnessed in the initial breeding knowledge transfer, Ontario producers accessed the US emu oil industry to develop their own methods to refine and market emu oil products. However at the same time, the experimenting emu entrepreneur challenged the more expensive US methodology of emu oil processing and tried unsuccessfully of creating "home brews" of emu oil. Subsequently, there were essentially two development streams of emu oil products competing against each other in Ontario. The conclusion to the development competition was won out with the advanced technological refinement process. The "home brew" products resulted in issues of spoilage and consistency of oil quality. Again, the lack of proper Ontario industry knowledge resulted in industry lag and inefficiencies, which contributed to producers exiting the industry in frustration. Today, emu oil refining is mainly conducted in Texas by two different firms along with operations in Pennsylvania and British Colombia. There are plans for an Ontario emu oil refining facility to be established, but little details could be extracted at this time.

Emu Oil Product Lines

There are three main emu oil brands in Canada. Two of the larger names are produced and marketed out of Ontario while the other originates from British Colombia. These brands have successfully captured the majority of market share within the retail outlet sector in Canada. Specially, the success has been established in the health food retail sector in large integrated chains. In most cases, that chains are generally headquartered in the golden horseshoe area of Ontario with retail branches spread across most of Canada. Traits of the successful suppliers include consistency of product, product quality, product support (educational), willingness to vary margin levels, and product diversity. Generally, these producers tend to separate the marketing portion of the business from the production aspects. It is important to note that at the same time there are numerous other emu oil producers who have established their own independent marketing channels for their emu oil products. In some cases, smaller health food retail chains have been accessed while the majority of the sales occur at rural markets, trade shows, retail meat outlets and farmgate sales.

Marketing Channels

As previously mentioned, the successful emu oil marketers have accessed various retail chains. To accomplish this task there have been a number of different methods established in the marketing process. Generally, producers have established their own marketing entities to compete for access in stores. With this competition there are a number of different wholesaling, distributor, and or direct selling methods used to gain market share. As there are no reported statistics on the competition for market access, the following estimations are provided.

Margins Emu Oil Producer > Retailer: 30% and upward

Emu Oil Producer > Distributor 20-25%

(Note: these values generally change depending on the size, market area and volume levels of retailer and distributor)

Current price levels (Fall 1998) for high quality emu oil is as follows:

100% emu Oil	2oz	\$18.00 - \$20.00
100% emu oil	4oz	\$34.00 - \$38.00
100% emu oil	1 litre	\$90.00 - \$110.00

In addition to marketable 100% emu oil, there are a multitude other emu oil related products that appear to be continually exposed to markets. These products contain various levels of emu oil percentages. The depth of emu oil products appears to be limitless. For example, CEMU is now exploring emu oil based cosmetic products.

As there are no governmental limitations on cosmetic or general healing remedies this product development movement continues. However, emu oil has yet to be granted official health status by Health Canada. This is due in part to a lack of scientific data to support any medicinal claims with this product. Most industry participants see the hurdle of obtaining Health Canada approval as the key to significant prosperity for emu oil products. However, the American emu industry has made some inroads in developing scientific data to support official governmental health claim certification. In fact the American Emu Association has set up an official oil standards group to implement recommendations and standards for the industry. Currently, Canada has two representatives on this body. To date this body developed research on emu oil qualities as well as combining much of the world's research on this product.

Conclusions, Lessons Learned, and Policy Implications

The ratitite industry in Ontario is facing an interesting management problem involving the production of birds and effective marketing of various end-products. Successful management of the production and emerging marketing issues will determine the rate of progress and future viability of this industry. On the production/supply side, the beginning of the industry was shaky at best, although the breeder market did perform well for the first few years. The market demand for end-products did not guide production in this industry. Rather, an inadequate understanding of the shift in consumer preference towards low fat, low cholesterol and low calorie diets since the early 1980s induced initial production followed by a frenzied breeder market for birds. Unfortunately, the prolific reproduction rate of emu led to an oversupply of birds (chicks) more quickly than any one involved in this industry might have anticipated. As a result of over-supply and low consumer demand, the bubble in the breeder market burst in 1995. The landing could have been somewhat softer had there been necessary market infrastructure in place for various end-products. However, this was not the case. Various end-products were not developed, nor was any special attention paid to consumer preferences for them, and the necessary marketing channels for wholesale-retail markets for those products had not been established. Consequently, the anticipated returns which were at the heart of initial euphoria in this industry and propelled the breeder bubble, were not realized. Since the forces of supply and demand in the market place were not recognized, the price discovery mechanism, so vital for successful marketing of a new product, was ill perceived. As a result, improper variables were targeted to influence consumers interests for emu products in Ontario.

Our analysis revealed that unlike poultry, beef or hog producers, emu farmers must recognize the nature of joint production of emu meat and oil. To be economically viable, they must sell emu meat as well as emu oil. A direct policy implication of this finding is that due attention needs to be focused on the development of marketing channels for both of these end-products. Since the marketing of meat (fresh and frozen) and oil may spread, and many producers are already too thin in terms of (production, marketing, and sales) management, we believe that there is an economic synergy for supporting a marketing cooperative such as CEMU. However, additional professional assistance and council may be required for the future success of this cooperative in developing various end-products consistent with consumer preferences, and the development of new marketing channels to profitably distribute those products.

Although emu meat has a protein component comparable to that of beef, it contains significantly less fat, cholesterol and calories it should have been well received by health conscious consumers in North America. That did not happen. Our own consultations with the emu producers in Ontario and research reports from Alberta, Louisiana and Texas revealed that price is the most important factor influencing consumer decision to buy emu meats. The health attributes do not seem to matter if the meat is priced at a premium to that of beef. Our econometric analysis suggest that for chicken, beef and pork over 93% of the changes in demand can be attributed to changes in

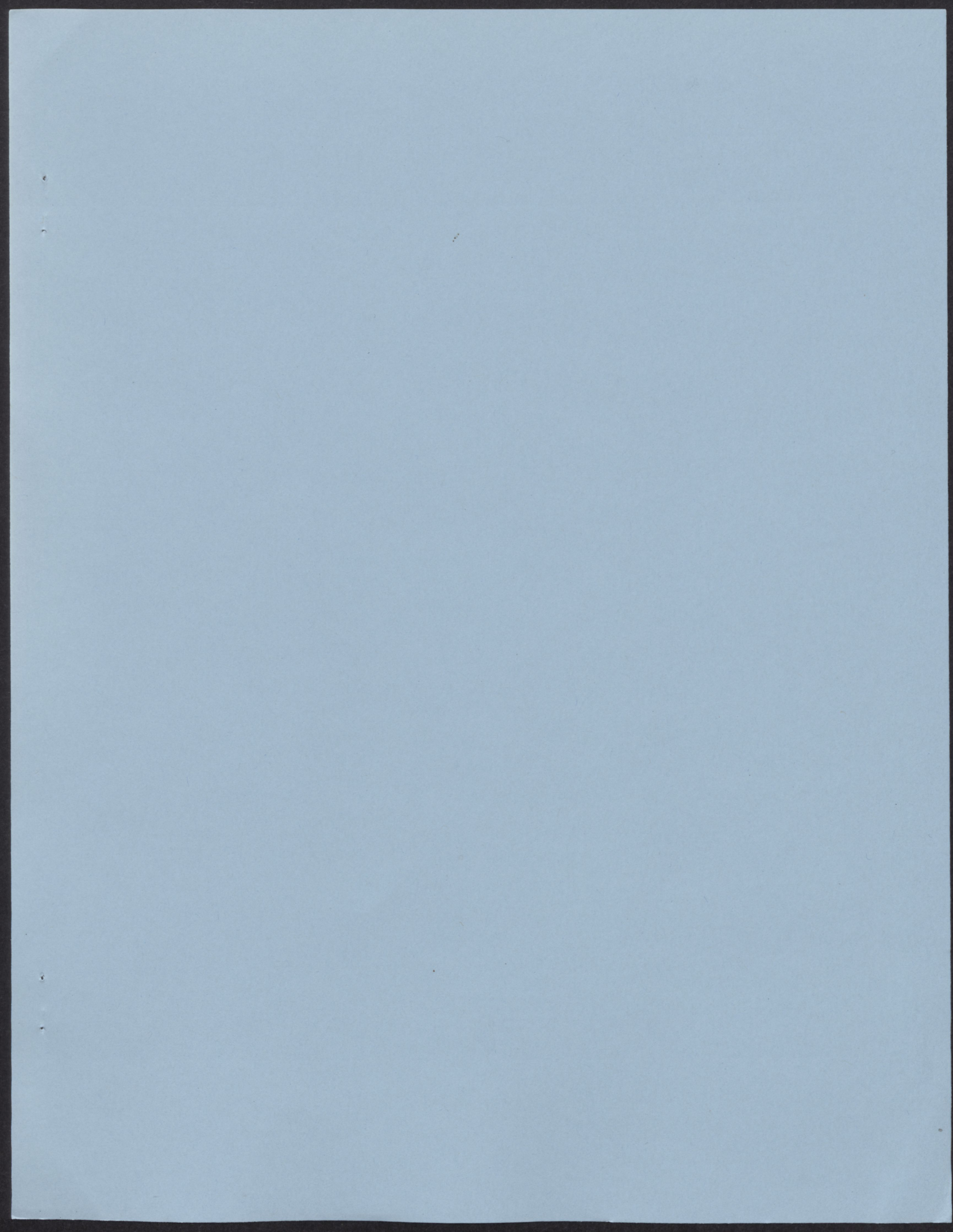
respective prices of these meat products. It is highly probable that such a strong effect of price changes on consumption is also a feature of the demand for emu meat. This implies that any attempt to market emu meat on a larger scale by focusing on factors other than the price is likely to fail. The emu farmers must switch the direction of their focus from competition based on health issues to competition based on prices.

Another issue related to the pricing of emu meat is to target beef. There appears to be a strong preference among producers in the ratiite industry to target the beef market because the demand for beef is more sensitive to price changes than those of chicken and pork, and emu is a red meat. Although the demand for beef is more price elastic than other meat products, a closer look at the changes in the beef industry during the last decade reveals that efforts to produce lean beef, pastured beef etc. to accommodate consumers health concerns are now paying off. It is likely that the demand for beef and specialty beef products will grow in the future. Once again, it is unlikely that premium priced emu products will substitute for beef in the short term.

Finally, the industry needs to focus on more innovative promotion for various emu products. Since the vast majority of Ontario consumers do not have any experience with emu meat, oil or other products, education should be a key component of product promotion. Alternative ways to prepare emu meat along with other relevant information about grading and nutritional values should be on the product label. While it would be costly to provide this information in the short run, in the long-run the benefits will outweigh the costs.

Appendix 1.0: Survey Respondents

Name	Organization	Location	Contact #	Emu #'s	Other
Paul Witmer	CEMU	Cambridge	519-740-3740	Industry Association	Current CEMU president also Emu farmer
Glen Thompson	ORA	Kitchener	519-579-0188	Industry Association	Current manager of the ORA
George McBride	Farming	Kincardine	519-396-8997	200-300	Current president of the ORA
Alison Downie	Crosshill Emu Farms	Millbank	519-699-6070	600+	Emu industry developers in Ontario
Tim Height	Tiger Paw Exotics	Arthur	519-848-6736	0	One of the original Emu importers to Ontario
Leon van Diver	van Diver Exotics	Okalahoma	405-373-2648	0	American exotic animal breeder who exported emu's to Canada
Elton Dunk	Alberta Agriculture	Edmonton, AB	elton.dunk@agric.gov.ab.ca	0	Current alternative livestock marketing director
Lyn Stegman	Alberta Agriculture	Lacombe, AB	403-782-3301	0	Agriculture extension agent - alternative livestock
Gary Boyd	7 B-Haven Acres	Leduc, AB	403-986-8797	125	Emu producer, secondary income
Paul Hermary	Hermary Emu's	Clive, AB	403-784-3379	25	Currently exiting industry; founder of ARA, CEA and CALC
Edi Sutter	Emerald Emu Ranch & Diversified Animal Management	Alix, AB	403-747-3872	450	Largest emu producer in Alberta; Developing new mobile processing facility for alternative livestock
Howard Johnson		Wainwright, AB	403-842-4830	40	Surveyed at Edie Sutter farm
Jim Johnson		Viking, AB		100	Surveyed at Edie Sutter farm; in midst of building his emu herd



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