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Will the big birds fly?

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ABSTRACT

Modern ostrich farming in New Zealand commenced in 1994 with importation of eggs. In 1997 the first processing of ostrich meat for the domestic market occurred. By 1999 there were estimated to be 2500 breeding hens, 12,000 chicks and 10,000 rising 1-year-old birds.

The current domestic market for ostrich meat is about 100 tonne annually and there has been an increase of 70% in the last 12 months. About 4000 yearling birds provide meat for the domestic market. Export of ostrich to Europe commenced in 2000.

At current prices the limiting constraint is achieving 15 slaughter birds per hen each year. Slaughter birds need to be over 95 kg live weight. Quality of hen nutrition is considered a critical factor influencing embryonic mortality and chick survival. The target rate is being achieved by some farmers, but for this to be an industry average, further developments in breeding hen nutrition and young chick survival will be required.

Keywords: ostrich; New Zealand; reproduction; feeding; products.

BACKGROUND

Feathers, eggs, meat and skins from ostrich have been used since ancient times. For example eggs are valued by the Kalahari Desert people as a vessel for carrying water. Arabian peoples used ostrich skins for clothing (Tuckwell, 1997). Ostrich farming developed in South Africa from the 1880s to 1920s in response to demand for feathers. In New Zealand ostrich were farmed near Christchurch from 1883 (S. Griffiths pers. comm.) and near Auckland in 1886.

Dictates of fashion led to the decline of the feather industry in the 1920s. Demand for ostrich leather led a revival in South Africa in the 1960s. In the 1980s ostrich farming developed in Israel, Europe, USA and Australia. This expansion was investor driven by people expecting to sell progeny for a similar high price to that which they paid for their initial breeding birds. Alas, all bubbles burst, and the industry has retrenched world wide as the demand for product is exceeded by bird supply.

Development of the New Zealand Ostrich Industry

The modern ostrich industry commenced in New Zealand in 1994 with importation of eggs and of live birds in 1995. The sale of the hatched chicks or imported birds for about $15,000 per bird lasted for about 3 years. During 2000 proven breeders were selling for $400 to $700 per hen.

The first ostrich processed in New Zealand were killed and boned in February 1997 at Lincoln. Few birds were available for processing over the subsequent 12 months, so due to scarcity value, meat was initially traded at $70/kg. Within a year, supply of birds exceeded demand and the price reduced. Various operators entered the market but found marketing conditions difficult, as consumers had to be educated to the product. By the end of 2000 the average price for all the meat from a bird was $16.75 per kg, and the annual national demand was estimated to be 100 tonnes, which required 4000 birds. In the winter of 1999 the New Zealand Ostrich Association estimated there to be 2500 breeding hens and 12,000 juveniles in New Zealand. (A. Munroe pers. com.). Ostrich meat is now a recognized product within the hospitality trade and market expansion of 70% has occurred over the last 12 months.

An impediment to the early development was that ostrich were not defined as ‘stock’ in the Meat Act 1981, and could not be processed through MAF licensed plants. To process ostrich, operators had to find suitable facilities, obtain a licence under the Health (Regulation of Premises) Regulations 1966 and operate under the Food Hygiene Regulations 1974. Processors had to develop their own in-house inspection procedures. The adoption of Ostrich and Emu Processing Standard 5 prepared by the industry and MAF, together with the introduction of the Animals Productions Act 1999 has facilitated the processing of ostrich.

In December 2000, protocols for export of ostrich meat to Europe were adopted, and export commenced. This has taken the pressure off the local market as the only outlet for meat. Protocols for export of meat to the USA, and Asian countries are in various stages of development.

Initially there were no outlets for ostrich pelts. New Zealand tanners had to develop skills in processing. There is currently a limited local trade in tanned ostrich leather. The volume of birds processed has led to the development of export of green pelts mostly to buyers from Southern Africa and tanned pelts to Korea.

Reproduction and Production systems

The basic biology and production is well established (e.g., Keibich & Sommer, 1995; Tuckwell, 1997). The essential features are that birds will commence breeding at two years of age. The breeding season is from about September to February. A hen lays an egg at two-day intervals for 3 to 4 weeks and then has a rest. High producing hens lay over 50 eggs in a season. Eggs are laid in the late afternoon, and are collected after lay. They are stored at less than 18 degrees centigrade for up to 2 weeks prior to incubation at 36 degrees centigrade. Incubation takes about 42 days. Warmth is essential for chicks till about 3 months of age. From about 3 weeks of age chicks usually have access to pasture as well as compounded feed. From 3 months birds are paddock managed usually with daily feeding of compounded feeds. By 12 months, birds...
are approaching mature size and well-grown birds are over 100 kg live weight.

A stratified production industry is emerging in New Zealand. Contract incubation and hatching services are available. Some people are concentrating on chick rearing, taking chicks at day old and rearing till 3 months of age. Less specialized is the finishing of birds from 3 months to processing at about 12 months, which fits relatively easily into existing farming systems and needs no special facilities.

**Digestion and feeding**

Ostrich are monogastric digesters. Their system is further characterized by having no teeth although they are grazers and browsers. Unlike other birds ostrich do not have a crop. Food goes directly into a glandular stomach, proventriculus. It then passes to the gizzard to be ground by stones the bird has ingested. Having stones available is essential for birds of all ages. The functional large intestine is effective at energy digestion and can provide half the energy requirements. Ostrich can utilize fibre more efficiently than poultry (Cilliers & Huchzermeyer 1998). Data from that source and others (e.g., van Niekerk, 1997) have been used to establish ostrich energy and protein requirements, although the latter have frequently been based on poultry data. Specific amino acid, vitamin and mineral requirements have yet to be quantitatively established, and the supplementary requirement of such nutrients under grazing regimes have yet to receive research attention.

**Farm production**

Farm production has been variable with some farms averaging over 50 eggs per hen in a season to others where all hens have failed to breed. Chick mortality has been encountered widely, and in some cases has resulted in deaths of entire batches of chicks. From 3 months of age the juveniles are relatively robust although environmental factors beyond the control of the farmer have caused devastation. In particular, low flying balloons cause distress, and major injury and death result when birds run into fences at high speed. Carcase weight has varied from less than 40 kg to a maximum of 75 kg. Average carcase weights are in the order of 53 to 55 kg.

Many breeding hens are managed in small numbers on lifestyle blocks and production is variable. An indication of farm performance is provided from an Auckland farm with 38 breeding hens. The ages are from 2-year-olds in their first breeding season to 6-year-old birds. These hens produced 1729 eggs, an average of 45 eggs per hen. Individual performance ranged from 1 egg to 86 eggs. 1604 eggs were put into the incubator. Dirty eggs and eggs laid into pools of water were rejected due to contamination and high levels of failure of these eggs. Chalky eggs, and small eggs were also rejected. 1370 chicks hatched, a hatch rate of 85.4% of eggs incubated or 79.2% of eggs laid. Both figures are considered high compared with other farms. This farmer feeds hens at between 1.8 and 2.2 kg feed per hen per day during the breeding season and the annual cost of feeding in this system is $550 per hen. This requires a yield of greater than 35 slaughter birds per hen to reduce the hen feed cost per slaughter bird to below $16, a figure this operator has identified as essential for economic production.

**Cost of production and product value**

Commercial incubation charges range from $20 to $50 per chick; and average about $30 per chick. Commercial chick rearing is available for $5 per chick per week, a cost of $60 per chick to 3 months. One person can look after about 1200 chicks, as a full time 7 day a week task. From 3 months costs are variable, depending in the main on feed costs. A grain-based supplement feed up to 1 kg per bird per day is common. Lower cost systems using silage and balage have been successfully used.

| Typical production costs per slaughter bird processed (based on feed at $400 per tonne): |
|----------------------------------|------|
| Costs of breeder feed           | $20  |
| Incubation costs                | $35  |
| Rearing to 3 months            | $60  |
| Rearing 3 to 12 months         | $100 |
|                                  | $215 |

Meat: At about 12 months of age well-reared birds will be 95 kg to 100 kg live weight with the best birds being 120 kg. Our records give a consistent 54% dressing percentage. Yield of saleable product is variable from 42% to 60% of carcase weight. Carcases are boned to sub primals, which are silver skinned and usually vacuum packed. Student projects have measured the chemical fat level of muscles at about 1%. The low fat level does not reflect the fat status of birds, as they lay down fat on the breast, around the tail, along the back, and around the intestine. Meat payments for a 55 kg carcase are in the order of $2.50 to $3.00 per kg carcase weight.

Pelt: Pelt value depends on the area and grade of pelt. Best prices are paid for pelts over 13 sq ft (associated with birds over 50 kg carcase or 95 kg live weight). An international grading system is used to assess the pelts in the crust (partly tanned state) on a 1 to 5 scale. Grade one has no imperfections and grade 5 has no commercial value. South African farmers typically produce 20% : 30% : 30% : 20% : 0% for grades 1 to 5 respectively. At present New Zealand production is typically 2% : 9% : 38% : 32% : 19% for the same grades. For pelts over 13 sq ft the New Zealand farmer is currently (March 2001) being offered $350: $260: $170: $80: $0 per pelt for pelts of grade 1 to 5 respectively.

Recently, meat and pelt payments have been integrated into a single payment and $7.25 to $8.00 per kg carcase weight is being offered for birds over 50 kg carcase.

**Constraints to production**

To be viable the industry needs to average a minimum of 15 chicks per hen surviving to slaughter. The majority of ostrich farmers are not achieving this. The figures provided by the New Zealand Ostrich Association show that the national average is less than 5 chicks per hen in the last season. Wastage occurs through failure to breed, embryonic mortality in the last 2 – 3 weeks of incubation, and chick mortality in the first 6 weeks. Hen nutrition is considered a major factor influencing fecundity and fertility, and disease factors include clostridia infections after chick survival.

Chick fade syndrome is a catch-all term for chick non
growth and mortality. Although *Clostridium* species are associated with this condition the actual specie or species have not been comprehensively identified. Vaccine is produced in New Zealand for export, but is not registered as a animal remedy for local use.

Our experience with this condition, and hopefully having overcome it, has lead us to the belief that bacterial diseases are secondary and nutrition and environmental stress are primary causative factors. The influence of breeder nutrition on yolk sac content and subsequent chick viability is not understood, but in our opinion is a critical primary factor influencing chick survival and growth. Early chick nutrition is also important to compensate imbalances from the yolk sac. We have found that changes to breeder nutrition during the laying season results in changes in egg quality and subsequent chick survival after 3 weeks on a new feed.

**To the future**

The New Zealand Ostrich Industry in 7 years has come from nothing to being positioned for expansion as a new pastoral export industry. The domestic demand for meat exceeds 100 tonnes annually and is expanding. Importers in Asia, Europe and North America are seeking New Zealand ostrich and bird supply will limit this trade in the medium term. Slaughter birds over 95 kg carcase weight are returning farmers about $400. The contribution of the pelt is a major factor in achieving this return.

Achieving a reproductive rate of 15 slaughter birds per hen, and slaughter live weight of over 95 kg are the challenges facing the industry. Both quantity and quality of hen nutrition are considered critical factors. Feed suppliers guard their formulations as commercially sensitive thus feed formulation are not critically evaluated. We believe that low cost finishing systems will be developed by farmers and thus are not a major constraint to industry expansion.

Will the ostrich industry fly? The timekeepers have their watches ticking at the finishing line. The markets exist and marketing systems are in place. Production systems with cost structures competitive with alternative land use have yet to be widely demonstrated.

**REFERENCES**


