

OSTRICHES

Note: This article is written by Blue Mountain International to support Ostrich Chapter in The John Nix Farm Management Book, that due to space constraints, the publication is unable to publish explanations and definitions.

Introduction:

Ostrich production was introduced to the United Kingdom during the early 1990s with breeding stock of very mixed genetics and no production history. Today production is limited to a handful of small farmers, working individually selling most meat production through local farmers markets and into the service industry. These farmers have their own breeding stock, incubate and raise their own chicks. Slaughter is carried out under contract in small, dedicated ostrich plants and red meat slaughter plants with a ratite license. Currently the farmers are responsible for all their own marketing. There is no production carried out under contracts to supply wholesalers or retailers. Ostrich are not sold through livestock auction markets.

Working in low volume presents significant challenges to both maximising revenue and controlling production costs, as it is not possible to achieve economies of scale. Ostrich are produced primarily for their meat, with their skins, fat and feathers providing additional revenue potential. Skins are generally sold to dealers, but minimum numbers of 200 skins are required, so it can require long-term storage to build up sufficient volume of skins. With the low production levels in the United Kingdom, the only market for the feathers and fat are those the farmers can generate from their own value adding.

It is difficult, due to the lack of processing infrastructure currently available to make farming ostrich a viable activity in the UK. It undoubtedly can be done but any prospective farmer needs to thoroughly research the slaughter / processing facilities in their chosen area and also be prepared to undertake direct marketing of the meat. This situation will continue until a substantial investment in production and provision of associated infrastructure is undertaken.

Welfare:

Animal welfare is a concern to British consumers. Ostrich are one of the oldest species and used to roam in many parts of Africa, the Mediterranean and Asia in all climatic conditions. The UK, whilst damp, has one of the most temperate climates without the extremes of temperatures experienced in many countries. Ostrich are produced free-range. Provided they have adequate nutrition, shelter for extremes of weather of suitable design for their age/production group and free draining soil, they can be commercially farmed very successfully in the UK. The World Ostrich Association has published welfare guidelines for ostrich and these can be found at <http://www.world-ostrich.org/woawelfare.htm>.

Production:

Significant variations continue to be reported on production levels and time taken to slaughter – this is a direct reflection of the nutrients fed, management systems and the variable genetics. The following table is an approximate guide to potential production under different production systems.

Breeder Production	Low Production	Medium Production	High Production
Eggs/Hen - Number	<50	50 - 70	>70
Hatching - %	<65%	65% - 80%	>80%
Surviving Chicks - %	<50%	50%-75%	>75%
Total Chicks *	<25	25-50	>50

*Chicks to Slaughter or reaching maturity

Slaughter Birds	Low Production	Low Production	Medium Production	High Production
Slaughter Age – Days (1)	365-425	425-485	300-365	180-300
Liveweight	85-120	85-130	90-120	90-125
Meat Yield – kilos	20-30	25-45	25-35	35-45
Feed Consumption – kilos (2)	650-785	785-925	470-620	230-435
Feed Conversion (3)	5.5:1 – 9:1	6:1 - 11:1	3.9:1 – 7:1	2:1 – 3.5:1

Notes:

(1) 180 Days to slaughter with high meat yields will be reached progressively, achieved through a combination of high production rations, good management and genetic improvement.

(2) Includes all feed fed, including any grazing and/or silage (when offered).

(3) Feed conversion based on liveweight must be used with caution – if birds carry too much fat their meat yields are low despite their high liveweight.

Nutrition:

Ostrich are browsers and not grazers. They require rations of high nutrient value with high levels of vitamins and minerals supplemented in the rations to optimise health and maximise their production potential. The following table lists the rations required at the different stages of production.

Ration	Production Requirement
Breeders Off Season	Replenishment of depleted nutrient reserves Build condition for the new breeder season.
Breeders in Season	Good Egg production, Adequate Nutrient Transfer to ensure strong, healthy chicks at hatch
Baby Chicks 0- 60 days	Smooth transfer from Yolk Sac Absorption to External Feed Intake
Grower Birds	Optimum Growth Rates Optimum Feed Conversion Excellent Muscle Growth-Meat and Skin Quality (Slaughter birds) Good Reproductive Organ Development (future breeders)
Pre-Breeders	Continued Reproductive Organ Development Early Puberty

The ability to achieve optimum production is dependent on the production design of rations fed and management standards. When developing budget production costs and revenue, it is essential to know the production potential of the rations used as these have a very significant impact on farm output and overall profitability. To put it simplistically rations can be split into 3 sections as defined below.

- **High Production Potential** – High Nutrient Density with quality ingredients and high levels of vitamins, minerals and other additives from natural sources. These rations support the full genetic production potential.
- **Medium Production Potential** – Medium Nutrient Density with quality ingredients and medium to low levels of vitamins and minerals.
- **Low Production Potential** – Low Nutrient Density with low-grade ingredients and low levels of vitamins and minerals. *A nutritional program that includes Grazing, Feeding Silage, Green Feed or vegetables of any type will fall into this category*

The important measurements of production are:

- **Cost Per Chick** – it is important to include the costs of incubation. If eggs are infertile or have poor hatchability, the costs are very much higher per chick hatched.
- **Cost Per Kilo Meat Produced** – the global industry average boneless meat yield is 25kgs to 30kgs per bird taking 300 to 400 days to slaughter. A few farmers report in excess of 40kgs of meat for larger genetic birds kept in excess of 375 days and, in some cases 100 days and more additional time. Ostrich have the genetic potential to achieve in excess of 45kgs per bird in less than 300 days, this before the beginning of any genetic development program.

- **Cost Per Kilo Meat Processed** – as the costs are basically the same to slaughter and process any bird, the greater the meat yield, the lower the costs per kilo for processing.
- **Feed Conversion Rates** - ostrich has the potential to achieve feed conversion rates similar to high production pig and poultry units. Good feed conversion is dependent on the production characteristics of the rations fed, management practices and genetics.
- **Kill Out Percentages** – when rations, are imbalanced Ostrich produce a high amount of fat, with limited meat.

The forage portion (usually lucerne) of an ostrich ration should be included in the rations. Dependency on grazing for a proportion of the nutrient requirements will result in reduced production, but when the dry rations fed are adequate and fully balanced, grass consumption will be minimal even when kept in grass paddocks. The main ingredients suitable for ostrich are lucerne, maize and soyameal. Some wheat and/or barley in small proportions can replace some of the maize, but maize is required for optimum health and production. DDGS, Maize Gluten Meal 60% or wheat-feed may be used in small amounts.

Feeding Rates and Consumption:

Ostrich breeders require 1.8kgs food as dry matter, this equates to 2.1kgs per bird on dry food as fed basis. When grazing or silage form part of the rations, then it is essential to ensure that sufficient dry matter is consumed to maintain the full balance of the feed.

The following tables illustrate the food consumption based on 90% Dry Matter as fed basis and assuming high production rations. Consumption can increase by as much as 30% when rations are nutrient deficient.

Slaughter Bird Age	Ration	Kilos	Accumulative Kilos
1 - 60 Days	Starter	25	25
61 - 140 Days	Grower	107	132
141 - 280 Days	Grower	291	423
281 - 365 Days	Grower	192	615

Breeders	Days	Daily Amount	No. Birds	Total Kilos	No. Birds	Total Kilos
Breeder	252	2.1kgs	2 (Pair)	1058	3 (Trio)	1588
Maintenance	113	2.1kgs	2 (pair)	475	3 (Trio)	712
TOTAL per annum	365			1533		2300

Note that feed consumption on low production rations is generally greater than medium and high production rations.

Breeding Stock:

Current breeding stock is in limited supply with little or no records available to assist a prospective buyer to calculate a fair value based on revenue potential. No serious genetic improvement programs have been undertaken. Breeders are generally kept in Pairs - one male, one female or Trios - one male, two hens. There has been some preliminary work carried out on the use of AI, but it will be a decade or more before this technology can be incorporated into mainstream production.

Breeders reared on high production rations generally start breeding from 15 months; the lower the production characteristics of the rations, the later breeding commences. There are many reports of breeders starting production as late as 3 years, adding to the rearing costs of breeders.

Costing Production:

At the time of writing feed ingredient costs remain unstable. Meat prices are increasing. Working in small numbers increases costs significantly as there are no benefits achievable from economies of scale. Costs of infrastructure, labour and all other costs vary according to existing farm infrastructure and the scale of the operation. For these reasons the published costs must be read with caution with a full understanding of the significant variables in production currently experienced with ostrich.

Feed is the most expensive input, controlling overall health, breeder fertility, numbers of eggs laid, eggs hatched, chick survivability, days taken to achieve slaughter weight, feed conversion and meat yield. Feed also controls the quality of meat, feathers, fat and skins. The faster a bird takes to reach slaughter the lower the costs of production. Not only do they eat less food, require less labour and infrastructure but also a faster return on working capital is achieved.

Breeder Birds:

Hand in hand with the greater the number of viable eggs produced comes improved chick quality with faster time to slaughter and improved feed conversion in the chicks. The more chicks produced per breeder, the lower the investment needed in breeder stock, breeder infrastructure and direct costs required per 100 chicks. Currently there is no steady market for genetic stock. That will come once ostrich are produced in volume under strong market conditions.

Slaughter Birds:

Yield determines revenue and days taken to slaughter determine costs. Therefore the challenge is to achieve commercial weights in as short time as possible.

Revenue:

Historically skin was the driving product of ostrich, which resulted in little incentive to modernise production methods. A sustainable meat market offers the greatest potential for growth and commercial success of ostrich. Doubling meat yields and halving time taken to slaughter transforms the overall economics. Meat revenue should attract approximately 75% of revenue, with other products adding valuable additional income.

Meat:

Ostrich produce a number of different muscles that vary in size and degree of tenderness. Currently there is no meaningful wholesale market in the UK; this is more as a result of low production volume rather than lack of potential demand. With low volume production, sales are mainly direct marketing and into the service sector achieving retail prices. Direct marketing requires additional processing costs and some value adding of the lower quality cuts. These are the approximate percentages of the different muscles and other components of the carcass, assuming all meat sold “off the bone” with the exception of the neck.

	Low Production	Medium Production	High Production
Liveweight	100%	100%	100%
Boneless Meat Yield	30%	32%	36%
Fan (large filet muscle)	2.6%	3.0%	3.5%
Other Filet Muscles	3.4%	3.6%	4.1%
Less tender Muscles	12.1%	12.6%	14.1%
Trim	11.9%	12.8%	14.3%
Total Boneless Meat	30%	32%	36%
Offal	5%	5%	5%
Hide	7%	7%	7%
Fat	6%	6%	6%
Other*	52%	50%	46%

* includes blood, bones, feathers, sinews etc.

Skins:

The market available for skins is dependent on location and volume produced. Skins are sold under grading systems, which are required to set producer payment as well as finished leather prices. The following are the different options:

- Finished Skins: Used by Tanneries or large producers tanning their own skins selling to manufacturers.
- Crust: Farmer Payment, but requires delayed payment. Numbers are insufficient currently in the UK for this system to be incorporated, but is the fairest of all systems for farmer payment.
- Green: Tannery to pay farmer or trader/dealer. Production levels are too small in the UK at this time to sell direct to tanneries.
- Green: Trader/Dealer payment to farmers. This is the main method of sale of skins in the UK at this time. A minimum number of skins are required and when slaughtering low volumes per month, skins have to be stored until sufficient are available for the dealers to collect. Low volume carries with it high handling costs and therefore is the least attractive method of selling skins, but the only way for a producer while volumes are low.

Full details of the different grades and definitions are available at: <http://www.world-ostrich.org/woaleather.htm>.

Gross Margins

Currently no wholesale markets are in place for ostrich meat within the UK due to lack of volume or buyers of birds for slaughter. All producers at the time of writing have to do their own direct marketing servicing local restaurants, farmer's markets, agricultural shows and events. A strong market for burgers at markets and events exists.

Breeder Production Costs

With little or no market for breeding stock, the main revenue stream currently comes from slaughter birds. Therefore, until there is a strong market for eggs and/or young chicks, breeder gross margins are best measured by the number of chicks that go for slaughter or replacement breeders. The nutrients fed to breeder stock determine egg numbers, egg viability, chick survivability and ability of grow to their full genetic potential and optimising feed conversion efficiency.

Production	Low⁽¹⁾		Medium	High	
<u>Costs Per TRIO</u>					
Kilos Feed/Trio	2,300kg	2,300kg	2,300	2,300	2,300
Feed Cost/Kilo⁽²⁾	£0.21	£0.21	£0.28	£0.33	£0.33
Slaughter Birds/Trio	30	50	70	100	160
Annual Feed Cost/Trio	£489	£489	£641	£753	£753
Other Production Costs/Trio⁽³⁾	£110	£110	£110	£110	£110
Total Production Costs/Trio	£599	£599	£752	£863	£863
<u>Costs Per Slaughter Bird</u>					
Breeder Feed Cost	£16.30	£9.79	£9.17	£7.53	£4.70
Other Production Costs	£ 3.67	£2.20	£1.57	£1.10	£0.69
Total Breeder Costs per chick	£19.97	£11.99	£10.74	£8.63	£5.39

Notes:

- (1) Feed consumption on Low Production rations can result in increased intake of $\pm 25\%$.
- (2) Based on ingredient prices as at July 2009 and assuming economies of scale. Add an additional $\pm 25\%$ should be added if purchasing in bags and/or with low annual tonnages.
- (3) Other production costs include a depreciation charge for capital invested in infrastructure. All these costs will vary from farm to farm depending on existing infrastructure and economies of scale.

Gross Margin Per Trio	Low	Medium	High		
Revenue					
Chick Price Per Chick*	£20.5	£12.5	£11.3	£9.3	£6.0
Chicks	£615	£625	£791	£930	£960
Less					
Production Costs	£599	£599	£752	£863	£863
Gross Margin/Trio - High Volume Production	£16	£26	£39	£67	£97
For Low Volume deduct					
Low Volume increased Costs	£189	£189	£189	£189	£189
Additional Chick Price	£6	£3	£2	£1	£1
low volume production – Total Chick Price	£26	£16	£13	£11	£7

* Note the reducing cost per chick with improvements in performance, transferred to production costs of slaughter birds below. The expensive chicks will also be at greater risk of slow growth, higher mortality and poor feed conversion.

Slaughter Bird Costs

The principal of rearing is to achieve the optimum growth in shortest time to contain feed usage and rearing costs. Meat Yield determines revenue and the number of days taken to slaughter determines the costs. The figures below assume the same meat yields and the minimum meat yield considered viable to keep processing costs under control. Finishing birds in less than 200 days is a realistic target, but requires the correct management practices, genetics and nutrients to support the genetic potential. It will take several years under good management and introduction of the correct genetic improvement program to achieve.

Meat revenue assumes all meat is marketed by the producer at outlets referenced above as there currently is no organisation yet purchasing birds. Skin Revenue is included at £50 – but this figure must be viewed with caution. Minimum numbers are required by buyers and the skins must be removed and stored correctly. The figures below illustrate that when early slaughter is achieved with the correct meat yield, commercial viability is no longer dependent on skin revenue.

Note these gross margins assume low volume production with no economies of scale as this is the current norm in the UK and assume direct marketing of all produce. Additional costs to cover the packaging and marketing are also included.

Production Level	Low⁽¹⁾	Medium	High
Days to Slaughter	425	365	300
Boneless meat	40kg	40kg	40kg
Average Meat Revenue/kg	£8/kg	£8/kg	£8/kg
Meat Revenue/bird	£320	£320	£320
Skin	£50	£50	£50
Total Revenue	£370	£370	£370
Less – Assuming Low Volume Production			
Cost of Day Old Chick (see breeder Gross Margins)	£26	£16	£13
Feed⁽²⁾	£214	£175	£165
Other Rearing Costs⁽³⁾	£106	£91	£70
Slaughter, Processing and Packaging	£75	£75	£75
Marketing	£5	£5	£5
Total Expenses	£426	£362	£328
Gross Margin Per Bird	-£56	£8	£42
			£136

Notes:

(1) Feed consumption on Low Production rations can result in increased feed intake of ± 25%.

(2) Based on grain prices as at July 2009 and assuming low tonnages. Deduct ±25% if purchasing in bulk with high annual tonnages.

(3) Other production costs include a depreciation charge for capital invested in infrastructure. Costs will vary from farm to farm depending on existing infrastructure and size of operation.

Dangerous Wild Animals Act:

A Dangerous Wild Animals Act (DWWA) licence is required for Ostrich. Recent changes, effective from October 2009, allow licences to run for two years with the mandatory veterinary inspection optional if the local council consider there is some relevant risk. DEFRA will also be issuing guidance on fees to ensure that these cover direct and indirect costs incurred. The BDOA will publish the final details once they known.

Conclusion:

It is difficult, due to the lack of processing infrastructure currently available to make farming ostrich a viable activity in the UK. It undoubtedly can be done but any prospective farmer needs to thoroughly research the slaughter / processing facilities in their chosen area and also be prepared to undertake direct marketing of the meat. This situation will continue until a substantial investment in production and provision of associated infrastructure is undertaken.

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Written by Blue Mountain International (<http://www.blue-mountain.net>), for Imperial College London Wye Campus' Farm Management to provide definitions and explanations to accompany the Ostrich Chapter of the Pocketbook 40th edition to be published September 2009 <http://www.thepocketbook.co.uk>