

COORDINATOR

E. Lionelle Ngo-Samnick

AUTHOR

Irénée Modeste Bidima

SERIES REVIEWER

Rodger Obubo

REVIEW

Vignon Dete, Ricarda Mondry and Pascal Nondjock

ILLUSTRATIONS

J.M. Christian Bengono and Mayya Lobova

TRANSLATION

BLS

LAYOUT

Stéphanie Leroy

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General information

Geese belong to a group of birds of the Anatidae family, which also includes swans and ducks. The goose is a domestic fowl, with the male referred to as a « gander » and the young as a « gosling ». Geese can live for up to 25 years.

Feeding geese is a somewhat demanding process. One of the main differences between geese and other species of poultry concerns the digestive system of the goose, which only allows it to eat grass. Compared with other birds like chickens, geese are much more resistant to disease and grow quite quickly.

Geese are birds with webbed feet and comprise over a hundred breeds. These can be divided into three main groups: the Guinea or Chinese goose, reputed to be very good layers; the Greylag goose, which produces very good meat; and hybrid breeds. With the weight of an adult bird ranging from $4-12~\rm kg$, a distinction is made between light and heavy breeds. Light breeds (Bress, Alsace, Normandy, etc.) weigh an average of $4-6~\rm kg$, while heavy breeds (Poitou, Bourbonnais, Toulouse, etc.) tip the scales at $7-12~\rm kg$ on average. The Guinea or Chinese goose is particularly well-adapted to tropical conditions.

A group of geese, known as a "gaggle", consists of one male (gander) and at least three females of a heavy breed or five females of a light breed. Geese are good at guarding the house and other birds: they have a good memory and give the alert by honking. Their meat, liver, feathers and down are very much sought after.

DESCRIPTION OF GEESE

The beak of a goose is equipped with cutting ridges that enable the bird to cut grass in a precise and efficient way. The feathers protect the body from the elements. A distinction is made between exterior feathers or coverts on the outside and plumules (also referred to as down), which form an insulating layer. Egg laying, incubation and the weather cause considerable wear on the plumage, which leads to their regular replacement – or moulting. This can take 2 - 3 months and is generally quicker for animals in good health. It is a particularly difficult time for the animals on account of their being more vulnerable to disease and they therefore need appropriate care.

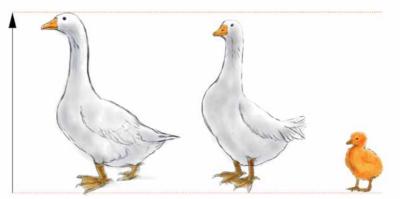


Their bones are light and their digestive tract short. Their body temperature of $40.6~^{\circ}$ C is higher than that of mammals. The eye is the dominant sensory organ, given that a goose can see up to 120 metres. It can hear shouts or cries up to a distance of 50 metres. Its urine mixed with faecal matter makes the droppings very liquid.



SEXING GEESE

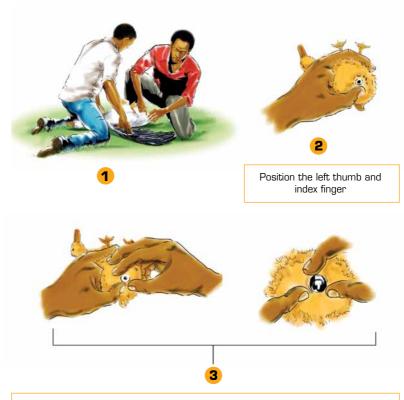
Sexing geese can be difficult in breeds that do not exhibit sexual dimorphism or in goslings. The gander is generally taller, has a longer neck and is more robust. The female's cry is higher and clearer than that of the male.



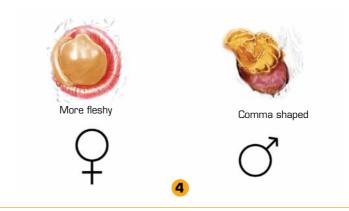
80 cm

Geese can be sexed by examining the cloaca. This can be done on goslings despite the small size of their cloaca and their embryonic sexual development. However, this technique is easier when the geese are adults. Examining the cloaca requires:

- laying the bird on its back and holding its head between your legs
- to avoid being pinched, have another person hold the wings
- exert sideways pressure on the cloaca (anus) with two fingers to ascertain the sex. The male has a pink reproductive organ shaped like a comma, while the female's organ is redder, fleshier, and made up of concentric folds.



Keeping the anus between the left thumb and index finger, roll back the skin with the right thumb and index finger



The female's vulva opens whereas the male's penis appears

3

BREEDING TECHNIQUES

3.1 Housing

Geese adapt easily to all living conditions and are not afraid of heat, cold or humidity. When breeding geese, the following aspects have to be taken into consideration:

- geese love to swim and very often mate in water. The ideal solution is to have a water bath, a pool or a fishpond. They mainly eat fresh grass, as well as products and by-products of vegetable crops (cabbage, lettuce, tomato, etc.)
- build a cage surrounded by a chain-link fence about one metre high to serve as a shelter and laying area. In the event of the presence of predators, such as reptiles, foxes and rodents, provide an enclosure that can be shut to keep the geese safe. Provide for shade with trees or by artificial means to protect the geese from rain, wind, sun and extreme temperatures. Also ensure ample ventilation and natural lighting. Put litter such as straw, wood chips, dried grasses, peanut shells, sand or peat in the cage. Also provide feed and drinking troughs and ensure that these are cleaned every day
- make sure the geese also have access to an outside yard for at least six hours each day.





The number of geese depends on production objectives. It is advisable to have no more than five goslings per square metre of enclosure. The recommended surface area for adult birds inside the enclosure is two animals per square metre.

3.2 Reproduction

Geese can reproduce after one year: a gander starts to produce sperm from the age of 30 weeks (7 $\frac{1}{2}$ months), while geese of the most prolific breeds start laying eggs at 32 weeks (8 months). As with any breeding, it is necessary to:

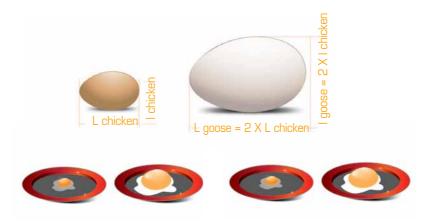
- select the most promising animals, those displaying minimum defects. Keep the strongest animals in good health and well developed. Geese with drooping or turned up wings should be eliminated from the reproduction process
- avoid inbreeding by separating the young from their parents and putting them in a separate enclosure if possible. Otherwise, separate either the young or the parents by exchanging the breeding male, for example, and only keeping the females of the gaggle. Geese prefer to mate in water and very often at around 9 o'clock in the morning, but it can also happen in the open air.

A goose can still lay even in the absence of a pool of water, but the likelihood that the eggs laid will be fertile decreases, especially if the animals are not well fed. Mating and egg-laying is seasonal for geese. The laying season can last 5 - 6 months. In general, a female goose will lay around 30 - 50 eggs in a season. A goose egg weighs 200 - 300 grams, while a chicken egg varies between 50 and 65 grams. The calorie content of a goose egg is approximately 145 kcal/100 g. As they generally lay in the morning, the ideal situation would be to lock the geese in at night and let them out from 10 a.m. To ensure that the goose always lays in the same place, provide nesting areas by always leaving an egg there. A female can produce for 10 years, though production does slow down from the fourth year on. In intensive farming, breeding stock is therefore changed after the fourth year; in more extensive farming, breeding birds are changed after seven years.



Goose in a nesting box

It is preferable to use artificial techniques on account of the goose being a poor incubator. Never incubate the eggs on the day they are laid; otherwise the chicks will emerge before maturing completely. Store and keep the eggs in a cool place, turn them from time to time and wait for 3 - 7 days after laying before incubating them.



Eggs intended for obtaining goslings have to be incubated. Several methods can be used:

- natural incubation (brooding), which consists of having the goose eggs incubated by other poultry birds (ideally chickens or turkeys). This takes 28 30 days
- artificial incubation, using an incubator, is easier when there are large quantities of geese and produces better results.

3.3 Raising young geese

When they hatch, goslings are covered with a layer of yellowish and grey down. The goslings lack basic movement skills for the first week. From the second week on, they grow, get stronger and become independent of their mother.

Young geese are raised in two stages:

- goslings aged from O to around 15 days
- goslings from 15 days to 3-5 months old.



Gosling just after hatching

Rearing the chicks

After it hatches, place the chick in an incubator or any healthy environment at a temperature of 35/37 °C with infrared lighting. Then leave it without food for 24 hours to allow ingestion of the yolk. Afterwards, put the chick in a brooder until its feathers appear.





$oldsymbol{\Omega}$ Brooder with a feeder and reserve on the side

Not being very disease-resistant, the goslings are raised in a clean, well ventilated shelter with the floor littered as described above (rearing techniques). The litter must be kept dry at all times to avoid mould. During the first week, plan on 1 $\rm m^2$ for 8 - 10 goslings. Then gradually reduce the number of animals, keeping 3 - 4 geese (3 - 12 weeks) per square metre and, finally, just two adult geese per square metre. The ambient temperature should be at least 24 °C for the first week and 18 °C at the age of 4 weeks. If the ambient temperature is lower, lamps need to be provided.

Rearing the goslings

From three weeks, let the goslings graze and keep them under shelter with two animals per square metre. To facilitate the feeding of goslings by way of plot rotation, grazing land of $40 - 50 \, \text{m}^2$ per adult goose needs to be provided.

3.4 Feeding geese

Geese eat a lot and put on weight very quickly. Though omnivorous, they prefer to eat vegetable matter. Their food can therefore be made up of grass, vegetables (cabbage leaves, lettuce, etc.), seeds, waste, kitchen scraps, etc.



Mix the food with water to obtain a paste and give it to the geese once a day. Put good-quality clean water in a drinking trough.

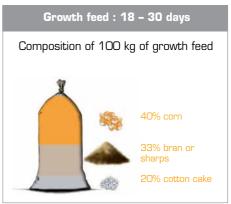


Gosling eating vegetables

Feeding of geese according to age is summarised in the table below:

Age of geese	From 1 - 17 days	From 18 – 30 days	From 30 days on
Type of food	Starter feed	Growth feed	Grower ration, fattener ration and force-feeding food, layer ration
Feed given in extensive rearing	Bread (without the crust) soaked in water or milk, crushed shells or bones. From day 4, start getting the goslings used to eating grass, increasing the quantity gradually (10% grass, 20%, 30%, etc.).	Vegetables (cabbage leaves, lettuce, etc.), seeds, waste, kitchen scraps, etc.	Food very rich in corn and starch (seeds, vegetables, potatoes)
Food given in intensive rearing	100 kg of starter feed consisting of 10% meat concentrate, 56% corn, 34% soya and 125 g of cooking salt. Allow an area of greenery measuring 100 m ² for 5 geese.	100 kg of grower ration consisting of 40% corn, 35% bran or middlings, 20% cotton cake. Allow an area of greenery measuring 200 m² for 5 geese.	
	Give food ad libitum (at 4 weeks, then 220 g pe depending on the quality greenery provided.		





• Feed depending on age

The table below sets out some of the nutritional requirements of geese bred for meat in the rearing period, suggesting two regimes – i.e. intensive fattening and more gentle completion including grazing (maintenance).

Requirements	Unit	Age in weeks (start-up period)		Age in weeks (growing, fattening and completion period)	
		0-4	5-8	9-11*	9 and older**
Metabolizable energy	kcal/kh	2800	2800	3100	2600
Crude proteins	%	20	20	19,5	13,6
Raw fibres	%	5	5	3	7,5
Calcium	%	1,14	1,14	1,1	1,2
Available phosphorous	%	0,42	0,42	0,41	0,38
Lysine	%	1,03	1,03	0,65	0,55
Methionine	%	0,54	0,54	0,37	0,3
Methionine + cysteine	%	0,88	0,88	0,7	0,59

^{*}Fattening regime, **maintenance regime (with forage) kcal per kg (kilocalories per kg)

By giving 500 g per day to each animal, the gosling can gain 2 kg per month.

Production of foie gras

Foie gras (fatty liver) is obtained by force-feeding waterfowl (ducks, geese) aged between 9 - 25 weeks. It is a bloated organ weighing 7 - 15 times the weight of a normal liver as a result of the accumulation of fat in the liver due to the intake of an unbalanced diet (too high in carbohydrates and low in amino acids) administered forcibly (force-feeding) by means of a tube or funnel. During the force-feeding period, the liver, originally weighing around 80 g, is fattened to reach a weight of 600 - 1200 g. Some producers of foie gras replace the rod with an endless worm screw system incorporated into the funnel and operated manually or by an electric motor.



Force-feeding a goose

The force-feeding method involves forcibly pouring a mixture of corn porridge and water into the animal's digestive tract for 14 – 21 days until its craw is full each time (around 0.6 – 1.5 kg of corn per day). The corn used has to be of excellent quality, without any plant protection products, no insecticides or mould, so as to avoid accumulation of this matter in the fattened livers and avert digestive problems in the geese.

The farmer kneels down and holds the animal between his knees. He inserts a funnel with a long tube containing the corn into the animal's throat, fills it with corn and pushes it down with the help of a rod.

The foie gras should have a uniformly light colour without any blotches or blemishes or any other defects in appearance. The consistency should be firm throughout and soft to the touch. It is essential to undergo excellent practical training before embarking on force-feeding and the production of foie gras. It is also imperative to ensure that there will be demand for the product on the part of consumers because production costs are high.

Although profitable, the force-feeding of geese is prohibited in several countries on grounds of animal cruelty.

3.5 Main diseases in geese

Although geese are disease-resistant (they do not often get sick), it is important to provide them with a balanced diet and ensure that proper hygienic measures are implemented. Preventive measures help to avoid the occurrence or spread of disease.

The table below sets out a disease prevention plan and expected effects:

Period	Weeks	Preventive treatments	Effects of the treatment
Start-up period (1 - 4 weeks)	Week 1	Diuretic and vitamins E and C for 3 consecutive days	Diuretics strengthen poultry against infections and inflammations. Vitamin C with a dose of 1 g per litre of water stimulates the consumption of water and food. Vitamin E is an antioxidant. Give this in the form of a dose of 10 ml per litre of water. Vitamins enable the animals to enjoy an optimum state of health.
	Week 3	Vaccine against Derzsy disease (Palmivax®) 18 - 21 days and diuretic (Hépaturyl®) for 3 consecutive days. For Palmivax : 1 x 0.5 ml dose administered subcutaneously (base of neck) or intramuscular (sternum) in the following manner: • Goslings and ducklings: one injection at 21 days of age. • Adult breeding stock: booster primary vaccination 1 - 2 weeks before the start of the laying season.	No side effects of Palmivax. Only vaccinate healthy animals. Do not vaccinate animals during moulting or laying.

Period	Weeks	Preventive treatments	Effects of the treatment
Growth period (5 - 8 weeks)	Week 4	Give minerals (bone meal, shell grit, etc.)	Strengthens skeleton of the geese.
	Week 6	Administer anticoccidials (Anticox®)	Dietary supplement helps to prevent coccidiosis. Dose of 500 g per ton of feed.
	Week 7	Give de-worming agent (piperazine citrate)	De-worming
	Week 8	Give minerals again	De-worming
Maintenance period (week 9 up to 6 weeks before slaughter)	Every 6 weeks	Give de-worming agent (piperazine citrate). For geese to be fattened, it is necessary to administer de-worming agent once more, 15 days before weaning. With regard to breeding stock, this treatment is carried out one month before the laying season.	
	Week 11	Breeding stock must be given a booster vaccine against Derzsy disease (Palmivax®) in week 11 and two weeks before the laying season each time.	Fighting Derzsy disease

The table below gives a summary of common diseases and relevant treatments:

Symptoms	Diseases	Causal agent	Curative treatments
Thirst, stunted growth, loss of feathers (mortality)	Derzsy disease	Virus	No curative treatment. Prevention with Palmivax.
Somnolence (light sleep-like state)	Fowl typhoid (Salmonella gallinarum)	Bacterium	Neocycline can be used: 5 ml per litre of drinking water for 3 consecutive days or Sulfa-volacrine: 10 ml per litre of water for 3 days. Thoroughly disinfect the poul- try housing and observe strict hygiene.
Weight loss, immobility	Coccidiosis	Bacteria (coccidia)	Administer one of these products: • Acocci, 15 ml in 10 litres of drinking water over 2 periods of 3 consecutive days separated by 3 days between administration; • Micoxid one 5.5 g sachet for 6 - 7 litres of water over 5 - 6 days; • Polycoccidiox, 10 grams in 5 litres of water over 2 periods of 3 consecutive days separated by 3 days without administering. Disinfect the poultry houses and quarantine them. Burn dead poultry and separate sick animals from healthy birds.
Respiratory mould due to the ingestion of mouldy corn	Aspergillosis	Fungus	Administer Fongistop in the dose of 1 heaped teaspoon per 6 - 7 litres of drinking water for 5 consecutive days. Disinfect the litter in order to destroy the fungus responsible for the infection in the poultry, which can also be transmitted to humans.
Diarrhoea, weight loss	Parasitic worms, Amidosto- mosis	Worms	One teaspoon of Terramycine powder dissolved in 2 litres of water for 5 – 7 days. Treat the animals that still appear healthy.
Weight loss	Tapeworm	Flat worms	Use a de-worming agent like piperazine citrate: 200 - 500 g per 1000 litres of drinking water.



Geese have to be raised well to make them more saleable. Good advertising is equally important.

4.1 Sale of geese

It is particularly important to direct meat production towards the end of the year, when more than half the demand for geese is concentrated. Geese are sold whole or cut into pieces. An adult goose costs between \leq 17 (11,155 FCFA) and \leq 39 (26,240 FCFA), i.e. at least \leq 4.25 per kg.



Consumption of goose meat

Breeding stock can also be sold for breeding. The price of a pair of geese varies between € 45 and € 65 and a pair of goslings sells for almost € 15. With a gaggle of geese, it is possible to produce around 90 geese per year. Where the goslings are intended for fattening and are sold 5-7 months afterwards, they will weigh an average of 7 kg, i.e. production of 630 kg of live weight annually, corresponding to 441 kg of eviscerated carcasses ready for cooking. The cost of raising the geese is around € 1,500; if an adult goose is sold for an average price of € 30, the proceeds are estimated at € 2,700, producing an annual profit of at least € 1,200.

Estimated operating account for a gaggle of geese (one male and three females):

1-year period	Expenses			Revenue		
	Quantity	Unit price	Total			
Buildings, installations and various small equipment	Fixed amount		€ 300	The gaggle of geese can reproduce and provide almost 150 geese per year. With losses, it is possible to end up		
Breeding males	4	€ 25	€ 100			
Prophylaxis	12	€ 10	€ 120	with at least 90 geese that can be fattened and sold at the end of the year.		
Production costs of chicks (goslings)	120	€ 1,50	€ 180			
Feed	12 months	€ 40	€ 480	sold for an average		
Transport and miscellaneous marketing costs	Fixed a	amount	€ 100	of €30. The expected revenue will be: 90 geese x 30 = € 2,700		
Water and electricity	Fixed a	amount	€ 100			
Contingency costs 9%		€ 120				
TOTAL	2,700 €					
The annual profit is €2,700 - €1,500 = €1,200						

4.2 Sale of foie gras

Foie gras has several categories: whole foie gras, foie gras, block of foie gras, block of foie gras with pieces, foie gras mousse, pâté de foie gras, parfait de foie gras.







Whole foie gras

Block of foie gras

Paté de foie gras

Although the price of foie gras differs from one country to another, it should be noted that 100 g of foie gras costs at least $\in 9$.

Estimated operating account for a gaggle of geese (one male and three females)

The gaggle of geese can reproduce and provide almost 150 geese per year. With losses, it is possible to produce at least 90 geese. On the other hand, force-feeding could result in the loss of 10 additional animals, meaning 80 geese for production. The average yield of foie gras will be 64 kg per year with 800 g of normal liver. 100 g of foie gras costs around \in 9.

The profit calculation is summarised below

Description of production	Quantity	Unit price (€)	Revenue (€)	Overall expendi- ture (€)	Profit
Meat production	80 geese	30	2,400	1,500	900
Production of foie gras	64 kg (80 geese x 800 g per goose	90 per kg (€ 9 per 100g)	5,760	1,100	4,660
TOTAL			8,160	2,600	5,560

4.3 Feathers and down

Intended for the industrial manufacture of garments and duvets, the feathers and down represent a significant source of revenue. They come from animals to be slaughtered and natural moulting. Harvested dry feathers are the most sought-after. Before plucking geese should therefore be kept in a clean, dry place. The feathers should consequently be packaged in containers that do not cause condensation or humidity, also making sure that the feathers and down do not stick to sides. It is important to emphasise that quill feathers from the tail and wings are not taken into account because they do not have any commercial value.



With a gaggle of geese, it is possible to produce an average of 90 geese, corresponding to 90 kg of feather and down per gaggle (81 kg of feathers and 9 kg of down). One kilogram of feathers or down costs more than \in 10. With the possibility of selling what is produced for at least \in 900 and assuming production costs of around \in 400, the farmer will generate an annual profit of \in 500.

ADDITIONAL INFORMATION

5.1 Some recipes

Roast goose

Preparation: 30 min Roasting in the oven: 40 min

Ingredients (for 6 persons)

- 1 goose
- 6 tablespoons of refined oil
- Salt.

Preparation

Pluck, empty, singe and clean the goose. Rub the inside with salt. coat the skin with refined oil. Place in an oiled pan. Put in a hot oven. Allow to brown, turn over and baste from time to time with juices coming from the goose. Then serve.

Braised goose

Preparation: 10 min Cooking time: 2 hours

Ingredients (for 6 persons)

- 1 goose
- 50 g of butter
- 1 large cup of stock
- 25 g of corn flour
- Salt, pepper or chilli

Method

Prepare and truss the goose. Melt the butter in a casserole dish. Then place the goose in the casserole, pour in the stock and season. Cover the casserole tightly can cook in the oven or on low heat for 2 hours. Strain the juices, thicken with the corn flour and add lemon juice. Serve the sauce separately.



5.2 Useful contacts

École Inter-États des Sciences et Médecine Vétérinaires (EISMV)

P.O. Box 5077 Dakar (Senegal)
Tel.: (+221) 33 865 42 83
Fax: (+221) 33 825 42 83

Email: eismv@eismv.org

www.eismv.org

Centre de recherches zootechniques et vétérinaires (France)

Institut national de recherche agronomique (INRA)
Impasse de Crouel, 63 000 Clermont-Ferrand (France)

Tel.: (+33) 04 73 92 09 11

Email: web@inra.fr

www.inra.fr

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Raising **geese**

Pro-Agro is a collection of practical, illustrated guides that are jointly published by CTA and ISF Cameroun. They are an ideal source of information for farmers, rural communities and extension workers in tropical and subtropical regions.

This guide provides tips and guidance on the breeding of geese. Anatomy, physiology and rearing techniques are presented with emphasis placed on common diseases, food and force-feeding of geese. One section of the guide sets out a few basic ideas for the marketing of geese as well as some recipes.

- The Technical Centre for Agricultural and Rural Cooperation (CTA) is a joint international institution of the African, Caribbean and Pacific (ACP) Group of States and the European Union (EU). Its mission is to advance food and nutritional security, increase prosperity and encourage sound natural resource management in ACP countries. It provides access to information and knowledge, facilitates policy dialogue and strengthens the capacity of agricultural and rural development institutions and communities. CTA operates under the framework of the Cotonou Agreement and is funded by the EU.
- Engineers without Borders (ISF) is a network of professionals in more than 52 countries to promote human development through improved access to scientific and technical knowledge. In Cameroon, ISF works together with local people to improve their livelihoods and strengthen their technical capacity by sharing and diffusing information adapted to their needs.







