



# Raising ratites: Ostriches, emu, and rheas



J.C. Hermes

**R**atites are a group of birds that includes ostriches, emu, rheas, cassowaries, and kiwis. Lacking the large keel on the breast bone where flight muscles attach, these birds are unable to fly. No ratites exist in the wild in North America; all were imported from Australia, Africa, or South America.

The most economically important species of ratites are the ostrich and the emu, with the rhea a distant third. The cassowary is rare and is not considered to have any economic importance, while the kiwi is an oddity and is virtually absent from North America except for a few in zoos.

## Production

Ratite management is similar to both livestock and poultry management. Adults are hardy and are able to withstand most of Oregon's weather challenges as long as they are protected from extremes.

## Incubation

Egg incubation often creates problems because most growers have little or no general knowledge of poultry and even less knowledge of incubation.

Like chicken, turkey, and other bird eggs, ratite eggs require constant incubation conditions for maximum hatchability. Even minor variations

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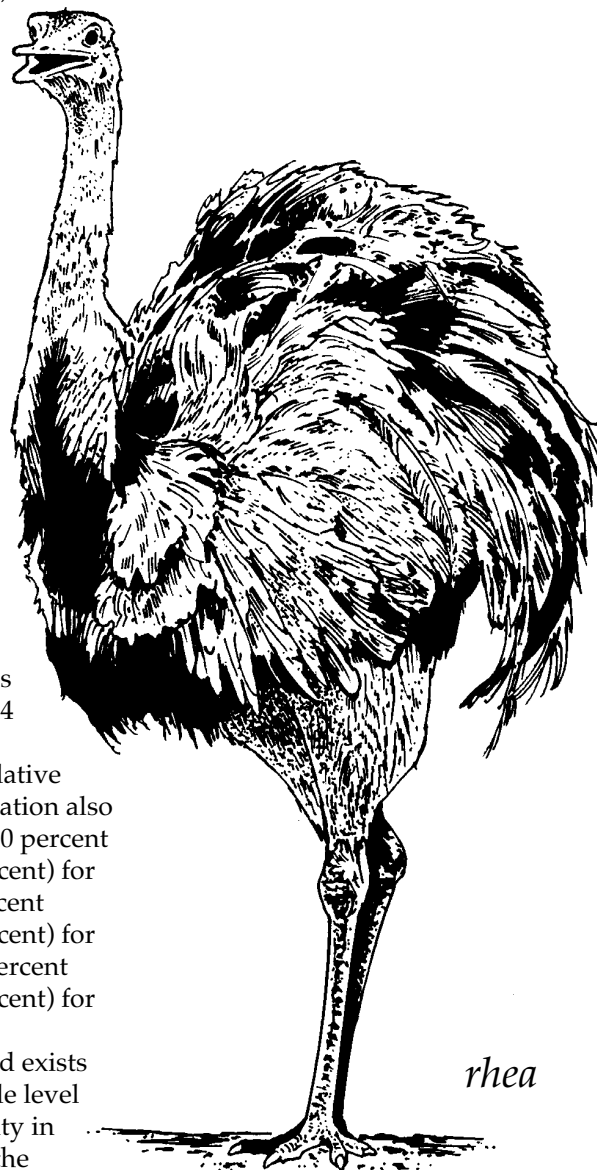
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can be detrimental. However, there has been little scientific research concerning the incubation and hatching of ratite eggs, so most current knowledge is from growers.

Length of incubation, temperature, and humidity suggestions vary greatly, so use the suggestions below only as guidelines. Hatching time varies from 36–45 days for ostrich eggs, 46–56 days for emu eggs, and 36–44 days for rhea eggs.

Requirements for relative humidity during incubation also vary with species: 10–40 percent (usually around 20 percent) for ostrich eggs, 35–55 percent (usually around 40 percent) for emu eggs, and 40–55 percent (usually around 45 percent) for rhea eggs.

Virtually no standard exists for minimum acceptable level of fertility or hatchability in ratite eggs. Therefore, the





determination of good versus poor fertility and hatchability is unknown. In most cases, if you obtain at least 50 percent hatchability of all eggs set, you probably are doing well.

Unless you intend to contract incubation and hatching with another producer, you'll need a forced-draft incubator able to maintain a constant temperature of between 96 and 99.5°F. Temperature for incubating ratite eggs is around 96.5°F.

Incubators vary in cost and capacity. Some cost only about \$500, while others cost more than \$9,000. The incubators of choice seem to be on the extreme ends of the cost spectrum. Any incubator is adequate as long as optimal temperature, humidity, ventilation, turning, etc. can be maintained.

During incubation, most ostrich and rhea growers set eggs vertically in the incubator trays, with the blunt end up. Emu growers set eggs on their sides. Eggs must be turned at least 3 to 5 times per day and up to 12 to 24 times per day.

There is no conclusive evidence of the best position or turning times for ratite eggs. We have used poultry information here and modified it to provide a starting point for these species.

Three to 5 days before eggs are expected to hatch, transfer them to a separate incubator used only for hatching. Do not turn the eggs after transfer. A slight lowering of temperature (1°F) and an increase in relative humidity (5 to 10 percent) may be beneficial.

Ratite eggs need to lose between 10 and 18 percent of their weight (in moisture loss) to hatch properly. Most growers weigh eggs weekly to monitor water loss.

If the eggs are not losing the proper amount of moisture, you may need to change the relative humidity. Many producers maintain several incubators at different humidity levels and move eggs as needed. Others cover parts of the shell with tape or fingernail polish to reduce water loss, or sand away part of the shell to increase water loss.

These practices are easy with a few eggs, but become impractical when more eggs are produced. Their effectiveness is unproven.

Many growers routinely wash eggs with water and sanitizers. However, it is best not to wash eggs. Instead, set only nest clean eggs. If washing eggs is necessary, use only warm water (110–120°F) and approved hatching egg sanitizers.

Fumigation of eggs with formaldehyde gas is becoming rare due to health risks and government requirements, and, therefore, probably should not be used. Many growers use disinfectants prior to incubating. It is important to follow instructions that come with these products to avoid potential disaster.

### Brooding

Early chick management of ratites is similar to that of chickens, turkeys, or game birds. Like most birds, ratite chicks are cold-blooded; they cannot sustain their body temperature from metabolism alone. They need supplemental heat for up to

## Know your ratites

	Adult height	Adult weight	Origin	Varieties
<i>Ostrich</i>	6–8 feet	250–400 lb	Africa	Red-neck, Blue-neck, Black-neck (a cross)
<i>Emu</i>	5–6 feet	110–140 lb	Australia	None
<i>Rhea</i>	4–5 feet	70–90 lb	South America	Greater, Darwin's, Blue, Gray, White

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4 months, depending on conditions.

Heat can be supplied from above with lights or heaters, or from below with heated mats or floors. Many growers use heat lamps.

It is imperative that the birds be given an area with a range of temperatures so they can select the temperature they require. If they get cold, they can move to a warmer area and vice versa.

As the chicks age, their metabolism catches up and they become warm-blooded, i.e., able to maintain body temperature. This change takes several weeks. It is important to help this process along by reducing supplemental heat gradually. Avoid abrupt changes.

Many growers believe inside pens with outside runs are required for proper growth in ratite chicks. This system allows protection from inclement weather as well as outside access for exercise, which may promote good leg formation and strength. Some growers brood chicks inside for only a few days before placing them outside with supplemental heat for cool nights.

Ratites usually are brooded on solid flooring, although wire-floored brooding areas also can be used. If using wire floors, take care to avoid drafts and to ensure that the birds' legs do not become stuck in the wire. Half-inch wire probably is sufficient.

Litter floors (sawdust shavings, straw, etc.) can be a problem, especially for ostrich chicks. Young ostriches and possibly

rhea will eat almost anything, especially litter, which can block the intestines, usually resulting in death. The problem may be reduced if chicks are placed on litter immediately after hatching instead of several days later.

Work at Oregon State University suggests that emu chicks perform well on wood shavings as litter or on chopped grass straw. Absorbent litter reduces labor by decreasing the time required to clean pens.

Solid surfaces, such as concrete overlaid with rubber mats, are becoming increasingly popular. Packed dirt or sand that is free of foreign material such as stones, wire, string, nails, etc. seems to be adequate. However, hard floors are difficult to clean, and as the birds age, pen floors become heavily soiled and virtually uncleanable.

### Growing

After about 1–2 months, ratites usually are grown in outside pens or pastures. At this age, they usually can tolerate normal weather conditions. However, extremes always are a concern.

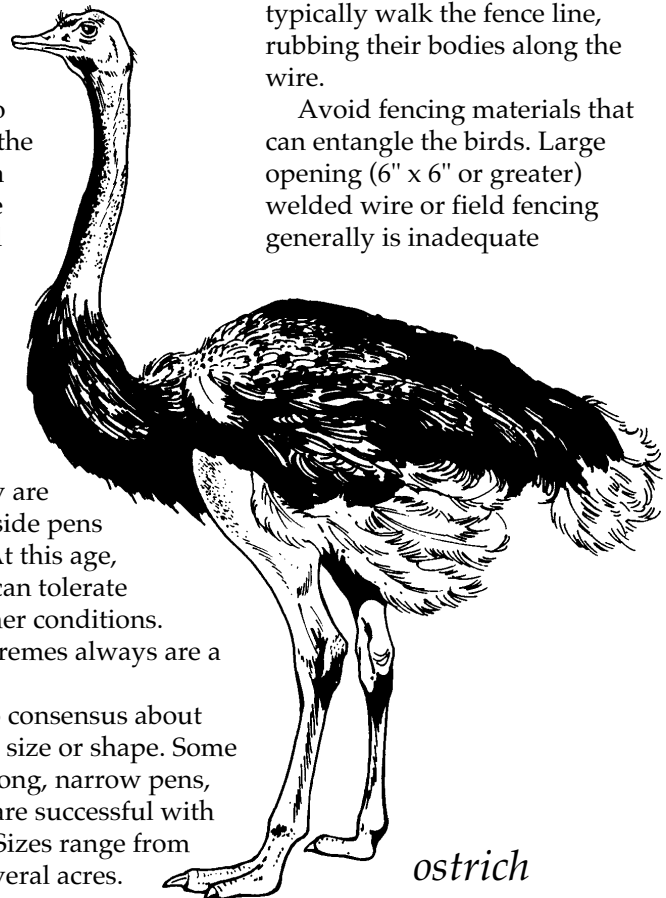
There is no consensus about optimum pen size or shape. Some growers use long, narrow pens, while others are successful with square pens. Sizes range from 20' x 20' to several acres.

Research at Oregon State University suggests that at least emu can be grown in fairly small (3' x 10') pens to 8 weeks of age (three to seven birds in a pen) and 6' x 32' pens through 7 to 8 months (four birds per pen).

Pen construction varies as well. Usually, 5- to 6-foot high fencing made of chain link, smooth strands, cattle panels, nylon link, 2" x 4" welded or woven wire, etc. is used. Ratites do not fly and usually do not try to jump over a fence that high.

Fencing must be strong enough to withstand the birds' leaning or bumping into it. It is best to have the fence posts on the outside of the pen, as ratites typically walk the fence line, rubbing their bodies along the wire.

Avoid fencing materials that can entangle the birds. Large opening (6" x 6" or greater) welded wire or field fencing generally is inadequate



*ostrich*



because the birds' legs can get caught in the wire, which is certain to cause a broken bone. In addition, any sharp fencing or wire ends must be blunted, bent over, covered, or removed, as ratites surely will find them, sometimes with disastrous results.

Shelters, as elaborate or simple as desired, should be available for inclement weather or for shade from the hot sun. Shelters may or may not have doors to contain birds when necessary.

It seems to be a good idea to feed the birds in the shelter. This forces them to become familiar with the structure and makes it easier to encourage them into the shelter if veterinary service is necessary. Some growers

construct squeeze chutes, or close confinement areas, in the shelters to contain the birds when close contact is necessary.

### Reproduction

Ratites usually begin to reproduce between 2 and 3 years of age. However, some birds lay as early as 18 months. Early layers typically lay few eggs the first year.

Average egg production is about 40 to 60 eggs per year for ostriches and 20 to 50 eggs for emu and rheas. Some layers may produce many more or less eggs than these numbers suggest. We cannot predict future egg production in these birds.

The productive life may be as long as 40 years for ostriches and 20 years for emu. Using low estimates, these birds could produce between 500 and 1,600 offspring in a lifetime.

The exact stimulus for the seasonal beginning and cessation of egg production is not well understood.

Ratites usually are paired during the breeding season, but some growers have been successful with trios (two females with one male), or with mass mating (groups of several males and females). Elaborate courtship displays and pair bonding seem to be necessary for proper breeding.

Breeding season varies, depending on species. Ostriches and rheas usually breed between about March and October, while emu lay eggs from early November through April. Laying seasons vary from year to year, depending on climatic conditions and location.

Breeding pens are similar to growing pens, perhaps a little larger. Ideal pen size for breeders is not known for certain.

The nesting area must be easily accessible to the grower. Ratites are ground nesters; they make a depression in soft soil, sand, or straw, which acts as a nest. You can provide these materials in the nesting area.

Gather eggs soon after they are laid. Most birds lay about every second or third day.

Be careful when gathering eggs. Some of these birds, especially ostrich males, can become quite aggressive during the breeding season, diligently



protecting the nest. In some cases, two people are required to collect eggs—one to distract the birds and the other to remove the egg from the nest. Egg collection is easier if the nesting area is placed where gates can keep the birds away.

Once the eggs are gathered, keep them cool, probably between 55 and 65°F. Much interest has developed in dipping eggs in disinfectant and/or antibiotic solutions. Although these procedures may be of some benefit, they are used sparingly in the poultry industry, with a great deal of quality control. They have not been proven to be safe and effective for ratite eggs, and should not be used.

Allow eggs to rest and cool for at least a day before setting them in the incubator. Most growers store ratite eggs at high humidity during the period between lay and set. Again, there is no solid evidence for this requirement, but chicken and turkey eggs hatch best when stored this way.

Ratite eggs can be stored for at least 7 days and probably longer. Most growers do not exceed 7 days of storage, however. Weekly settings make hatch scheduling easier and more efficient.

### **Feeding**

Like chickens, ratites require a relatively high-protein, balanced diet. There is little or no information on the specific nutrition requirements of ratites.

Most ratite diets are modified poultry diets, with changes in protein level and usually

increased vitamin and trace mineral supplementation. Most ratite growers feed a diet that is between 17–24 percent crude protein during brooding and growing, and about 22–23 percent for laying birds. Prepared feeds are available.

There is much discussion as to whether all ratites should be fed the same diets. There may be different nutrient requirements among these species, as there are between chickens and turkeys.

Some growers allow their birds access to forage, while others provide only the prepared feed. Alfalfa works well in growing and breeding pens. The general consensus is that ratites may require more fiber in the diet than chickens. Exact levels, however, are unknown.

## **Considerations for raising ratites**

### **Lack of research- based information**

There is little research-based information concerning the production of these birds. Some research is underway, but useful results are slow in coming. It probably will be several years before research-based information is published in a usable form.

Most current information is based on grower trial and error, and is modified from poultry information. Various groups and associations publish information, but it also is usually from growers, which doesn't necessarily make it unreliable, just unproven.

Take care not to consider all published information as useful. Many claims are made with little or no data to substantiate them. Contact as many reliable sources as possible, and modify the information to best suit your situation.

In 1995, Oregon State University began a ratite research program. As results become available, they will be provided to industry producers.

### **Zoning and farm plans**

In many areas of the country, ratites are not yet considered livestock. While various associations have successfully lobbied for livestock or poultry status, some regions, states, and counties have different requirements or define these birds differently.

*Before you purchase birds, contact your county planning office to make sure you can produce them in your area and to obtain any special requirements for raising ratites. When you write your farm plan, ratite value should reflect the expected market value—between \$500 and \$750 per bird at about 1 year of age.*

### **Perception**

The ratite industry still is in its infancy. Many in traditional agriculture have not yet accepted it as "real" agriculture. However, as the breeder market subsides, prices fall, and domestic slaughter increases, many in traditional agriculture, government, and academia will begin to consider ratite production a serious agricultural industry.



### **Establishment of markets**

The goal of the ratite industry is to produce ratites as a market animal in the near future. Marketable products such as leather, feathers, meat, and oil are considered to be the future of these birds.

A small amount of meat is being sold to some higher scale restaurants and markets, a few hides are being used in relatively expensive garments, and a small quantity of oil is being produced for niche cosmetic markets. Further establishment and growth of these markets are needed to sustain this industry.

### **Price**

In the early days of the industry (1986–1992), one of the biggest concerns for potential growers was price. At that time, only breeders were available, so the price remained high. Hatching eggs have sold for as much as \$2,000 each, while proven breeding birds have sold for up to \$80,000 per pair.

Recent downward price corrections reflect increased productivity and the need to establish slaughter and product marketing. Today, ratites raised for slaughter are valued between \$500–\$750 per bird.

Ratites may be poised to be another major agricultural industry. On the other hand, the industry may not last. Before ratites can become established as an agricultural commodity, significant problems must be overcome, including marketing, slaughter, and various production problems. Major industry players, grower associations, government agencies, universities, and marketing professionals must make the decisions now that will lead to future growth.



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