

Ostrich, an Analytical Study in Economic Geography

Dr. Huda Abdel Rahim Abdelkader

Ph.D. Researcher in Economic Geography
Directorate of Education in Minia – Egypt

Abstract: *The ostrich industry in Egypt is an emerging economic activity, which has spread especially since 1998 on the scale of small and medium farms, some farms and large companies.*

The study deals with the study of ostriches through an analytical study in economic geography. It deals with several axes including: Ostrich industry in Egypt and ostrich species through the geographical study of ostrich production: in view of the geographical distribution of ostrich farms in ancient Egypt and recent times, Ostrich and hatchery (Incubation), nests and egg laying, and production systems used in farms designated for ostrich.

The subject of ostrich farms deals with the types of farms, nutrition, products of ostriches, and the production of meat, leather and feathers of ostriches, along with other products such as fat, eggs, eyes and ostrich oil.

The research also deals with diseases affecting the ostriches and treatment and veterinary fortifications. Economic feasibility and the most important problems of ostrich farming in Egypt.

Keywords: ostrich, ostrich production, hatching, ostrich eggs, ostrich feathers, ostrich farms.

1. INTRODUCTION: OSTRICH

The ostrich is one of the largest birds but cannot fly to its large body and atrophy its wings, native to Africa and the Middle East. However, during the ages it has been subjected to poaching that was found in the deserts of the Middle East. Another similar type of ostrich exists in Southwest Asia where the ostrich was found in the Arabian Peninsula, and recorded its last existence in its natural environment in 1930.

The ostriches weigh about 100-150 kg and their height is about 2.4 meters. The ostrich is characterized by its astounding legs, where the ostrich can fly at speeds of about 60 kilometers per hour, one step up to 5 meters, and maintain that speed for half an hour. The ostrich is the only bird with two fingers in each foot. The range of birds has no claws.

The ostrich lives in the family from 50:40 years, and the length of the male is about two and a half, and weighs up to 150 kg. The ostrich is the heaviest and largest bird in the whole world, and the female is smaller than that [1]. Ostriches live in the company of predators depending on what God has given to the ability of the speed of the ostrich, which enables them to protect themselves from attackers [2].

The ostriches feed on plants and sometimes eat reptiles. They also eat plenty of sand to help them digest food. The breeding season starts in March to October about 8 months per year and the average egg production for females is about 60-100 eggs per season, up to 120 eggs. The ostrich egg weighs between 1 kg and 1.5 kg. The ostrich's egg alternates with the male on the incubation of the eggs, where the female embraces it during the day and the male embraces it at night. The ostrich egg is circular in shape, large in size, dark yellow and large, and ostrich eggs hatch after five or six weeks.

There are currently 3 strains of ostrich birds [3], [4], [5]:

1. Red-necked ostriches: the largest, most ferocious and most resistant to disease but less in egg production produce about 8 to 12 eggs per year.

2. Blue-necked Ostriches: Medium in size and wild in color, producing about 15 to 20 eggs.

3. African black ostriches: the smallest of them is a female in the production of eggs, the female puts about 40 to 60 eggs annually and some of them put more than 100 eggs.

African Ostrich (*Struthio camelus*) Like other ostriches have a huge body, supported by the legs large and strong used in the enemy, and topped by a long neck that ends with a small head, the legs naked. The color of the skin is different from the rest of the species, the eyes of the African ostrich are large compared to the head and decorated with long eyelashes.

The male feathers are black with the end of the wings and the tail is white, while the female is very pale gray with a little white in the wings.

The African ostrich is present in most African lands but extended its presence to Syria and is found in desert or semi-desert areas with evergreen vegetation and less dense forests.

The African ostrich consists of four breeds:

1. *Struthio camelus*, living in the highlands of the Atlas Mountains of North Africa, on desert and semi-desert lands in Morocco, Algeria, Senegal and Nigeria, and reaching Egypt, Ethiopia and Sudan.

2. *Struthio camelus massaicus*, living in Eastern Africa (Kenya and Tanzania).

3. *Struthio camelus australis*, located in the Middle East, has been extinct since 1960, located in southern Syria and Sinai.

4. *Struthio camelus syriacus*, located in South Africa as well as Zambia and Quinn.

The Syrian dynasty disappeared after its overfishing in the Negev Desert, Jordan and Saudi Arabia in 1960. Some samples found about 13 of this strain in Ethiopia and may be returned to the Negev desert. These four strains are threatened in Algeria, Burkina Faso,

Cameroon, Mali, Mauritania, Morocco, Niger, Nigeria, Central Africa, Senegal, Sudan and Chad. As such, they are listed in the endangered red list and are prohibited from trade. [5], [6], [7].

The ostrich industry in Egypt is an emerging economic activity, with some beginning to import enriched eggs. While others began importing adult birds with the establishment of an incubation plant for ostrich eggs, nursery nurseries and playgrounds for adults. Ostrich farms began to spread since 1998 on the scale of small and medium farms, some farms and large companies, and ostrich birds of prolific birds. In addition, because of the increase in fat and high cholesterol in the human body, the thinking of sources of non-traditional protein has been mentioned, which led to the use of ostriches because of their nutritional value and its usefulness in the treatment of many Diseases [8], and evaluation of the Egyptian experience so far can be seen as follows:

The ostrich industry in Egypt is a promising industry for the following reasons:

1. Provides the right environment for education throughout Egypt, including the south. Where atmospheric temperature is a determinant of many aspects of animal production. While the ostrich bears the high temperature of the atmosphere, and has already been the establishment of successful farms for small and large cattle in Beni Suef and Aswan, and the production of eggs and hatchery, but so far hatchery in the central hatcheries major, and encouraged these weather conditions on the trend of many breeders in Europe to establish farms For cattle in Egypt in partnership with Egyptian investors. The ostrich industry in Europe faces problems of low temperature, high land value, high labor costs, and problems of animal rights associations opposing animal slaughter, including ostriches.

2. The sandy, poor and desert lands are suitable for the establishment of ostrich farms, and farms have been successfully established in the areas of Egypt-Alexandria Desert Road, Ismailia Desert Road, Wadi Al Malak and Salihya, Ahmed Orabi, Eastern 'Awainat, Nubaria Amriya and other desert and reclaimed areas.

3. Egypt also has a geographical location and is a center for consumption in Europe, Asia and the Middle East. Encouraging local and foreign investors to invest in the ostrich industry in Egypt.

4. The availability of cheap labor reduces production costs compared to other production areas in Europe, America and Canada [9].

Geographical distribution of ostrich farms in Egypt, both ancient and modern: The first map shows the locations of ostrich farms spread in southern Egypt and Western Sahara. The geographical factors that are necessary for raising ostriches are the high temperature, the desert land, the presence of sand and gravel, where ostriches are adapted and cultivated in this environment, this map represents the period from 1900 to 2011 (fig. 1), [10].

The second figure shows the geographical distribution of the ostrich farms in 2018 in addition to

the farms mentioned in Figure 1, and distributed as follows: Alexandria, Giza, Cairo, Al-Qalubia, Beni Suef, Al-Dakahlia, Al-Gharbia, Aswan and Sinai (fig. 2).

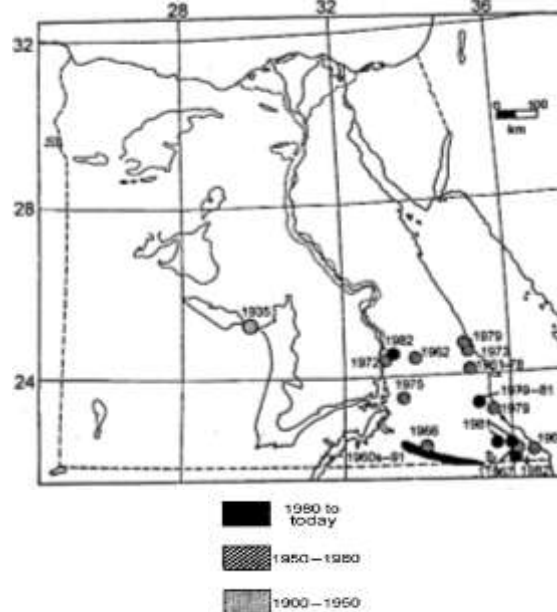


fig. 1. Distribution of the ostrich in Egypt from 1900 to today.

Source: Manlius, Nicolas. The ostrich in Egypt: past and present, *Journal of Biogeography, France*, 28, pp.945-953, fig.4.

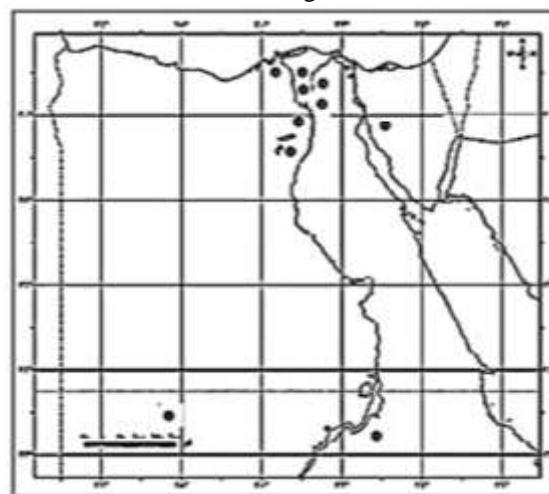


fig. 1. Distribution of the ostrich in Egypt today

2. GEOGRAPHICAL FACTORS AFFECTING OSTRICHES

2.1 Temperature and relative humidity

The sun rises throughout the year in Egypt with relatively low humidity, as the rise of relative humidity in the atmosphere increases the mortality rates in the early ages of the ostrich, and provides the opportunity to develop various diseases. Egypt also has desert land, which is suitable for raising ostriches where it can withstand relatively high temperatures because it is originally a desert bird [11].

2.2 Water Sources: Limited freshwater resources make an ostriches bird the ideal bird in breeding. Where he

can drink salt water, eye water and well water, because there is a gland to regulate salt in the body of ostriches.

2.3 Fodder: Desert areas can be cultivated with feed materials that are included in ostrich diets, which are headed by alfalfa clover.

2.4. Cost: The cost of producing ostriches in Egypt is lower than productivity in other parts of the world, such as America, Canada and Europe.

2.5 Market: Egypt has an important geographical position. The ostrich market of meat, hides, hatching eggs, ostrich chicks and adult ostriches is spread around the Middle East, Europe and Asia [12].

2.6 Select the location of the farm: Some ostrich farms are located inside the villages, but it is recommended to choose the location in the desert lands are cheap and suitable for the nature of ostriches and its behavior and requirements, in addition to the availability of land at a low price is a fundamental part of the economics of the ostrich industry, the need for ostrich farms for large areas of land, The site is characterized by the availability of water that is not polluted and suitable for education and subsistence, as well as that the water is suitable for irrigation, so as to grow clover, especially the type of Hijazi farm itself, because of its importance in the diets and nutrition of ostriches. It makes up about 75% of food at all stages of life.

Therefore, the following points should be taken into account in the site of establishing an ostrich breeding farm:

- The site should be away from sources of pollution, noise and banks, away from poultry farms, and should provide bumpers for wind and natural umbrellas (trees) and industrial and implementation of construction materials as simple as possible and easy to clean and disinfect.
- Consider that the engineering design of the farm serves the movement of the workers, in a one-way line from the sound bird pens to the sheds of diseased birds, and from the smaller bird pens to the larger bird pens, and not the other way around.
- The need for a housing for birds suitable height of the ostrich, and have a sloping roof to protect from rain, the room door must be at least a meter and a half to facilitate the exit and entry of ostriches, and can be room 4 birds and away from the currents of air, and to have farms stores for feed coarse and concentrated Technical conditions and specifications that allow storage and maintenance of feeds from corruption and pollution.
- Generally when planning to set up a farm ostrich must finish construction work before the arrival of birds to the farm. As the completion of the construction in the presence of birds stress on them, and negatively affect the production, and the printing of these birds, and vary the space needed by birds according to several considerations, including: the age of the bird, the productive purpose, and the area planted with green fodder, and also the potential of the available breeders, Shelters should be provided from the buildings and directed towards the sewers

so that they can be easily cleaned and disinfected. An outdoor shaded skylight covering 20% of the area should be provided to protect the chicks from direct sunlight.

- It is recommended that the walls of the brothels for chicks be less than 3 months mobile so that the barns can be expanded with the increase of age, the bird needs from one day to one month to an area of 1-5 square meters, and from one month to three months to 5-8 square meters allocated Of which 20% are shelters, and the rest are as umbrellas, and from 3-6 months to 20-30 square meters, of which 10% are shelters.
- Ostrich birds that raise to produce meat from the age of 6-12 months to 60 square meters of bird, and the floor of barns sandy level, with umbrellas make up 10% of the floor area. Or ostrich birds until the age of 6 months need walls 1.5 meters high, and be Adjacent to the surface of the earth, and need ostrich birds for more than 6 months to the wall about 2 meters high [13], preferably the walls of the network wire flex plastic covered so as not to hit the birds when the collision.
- The establishment of monsters to isolate the birds newly received and the last of the sick animals preferably in a location far from the rearing of education, taking into account that the height of the shelters is not less than 3 meters, and the ceiling is oblique, with the need to grow shade trees, and windbreaks between barns.
- The availability of feeders in the external fishes in the absence of green lentils, and vice versa in the sheds, preferably 120 x 15 x 35 cm, and the measures should be available 60 x 15 x 75 cm inside the pens and in the sides of the fishes, A ceramic basin lined with ceramic tiles, and the floor of the pens for the adult birds shall be spread with sawdust or hay, while avoiding the use of the chicks until 3 months in order to prevent any digestive disturbances.
- The least area of habitats that can be used in the breeding of mature ostriches is male + 2 females to get the appropriate chicks about 1000 square meters with the availability of umbrella 6 × 9 meters, and consider the provision of 2-3 meters between the barns to serve and prevent contact and quarrels of males, but This doubles the cost of investment in the walls, and that the doors in terms of the sides of the barns at an angle of opening 90 degrees, noting the ease of opening and closing.
- What we know today about spawning ostrich eggs is still very little, and there is still many and many that we do not know about the hatching of ostrich eggs. Therefore, it is necessary to intensify the research necessary to study all factors affecting the success of hatching ostrich eggs to ensure a high hatch rate, and thus increase the spread of such a lucrative industry with the provision of all the help of farmers to researchers to help them to achieve the best results.

2.7 Transportation: The ostrich can be transported by specially designed cages, and the ostrich can be moved

by a horse carriage, a two-wheeled or four-wheeled trailer. The adult ostrich can be moved in a large truck, the barrier should be covered with a suitable material, and the ostrich should be placed in a small storage shed before being loaded in a few hours until it is easily grasped and not weakened by fatigue or fatigue. And we have to route it through the barrier with flying light after another, bearing in mind that the shipment the unloading must be patient and long-lasting.

In the case of long distance shipping: it is better to book in the evening and then travel at night, in order to ensure that in a state of stillness and quiet also must be taken to take food and abundant water before being transferred because after being booked completely abstain from eating.

Egg transport needs special attention if the roads between the barns are not paved, which may lead to breaking the eggs, thus losing part of the capital during transportation. The egg should be kept in a shaded place that is not exposed to sunlight or air temperature. Used to collect eggs in a special basket after reaching the point of receipt of eggs, because they are the main source of egg contamination when lifted from the ground and transferred to the point of receipt in the hatchery building.

2.8 Storage: The humidity in the storage room should not be less than 70% and the temperature in the storage room is 4 m. This results in negative results where the plastoderm is frozen. Also, the temperature rise to above 20 m leads to the beginning of the division slowly, which has bad results on the rate of hatchery. If the conservation period is more than 7 days, this is done at a temperature of 12-15, the humidity of 75-80%, and the humidity in the storage rooms is important for the evaporation of water from the eggs, which leads to increased loss of egg weight. The hatching rate is affected by the hatching rate. In general, the hatching rate decreases gradually if the conservation period is more than 5 days to reach 0% at the twenty-fifth day even though the temperature and humidity in the previous limits. The loss of fluids in the eggs of ostriches, which leads to a defect in the composition of the body organs, and for the size of the chick ostriches and weaken, the embryos and chicks adhere to the crust and die [15].

And increase the humidity in the garden works on the slow passage of water vapor and the waste of respiration Ostrich embryo out through the pores of the crust is affected by growth and the fetus is distorted and the resulting ostrich clot is bulging lazy abdomen loose body, leading to slow decompression of chickpeas chicks, and the temperature of the atmosphere to 46 degrees Celsius During the house-laying season, egg production is low and the pollination rate is low. Birds do not have an ethnic glands to get rid of excess heat in the body. Ostrich birds have the potential to raise body temperature by 7 and 4 degrees Celsius above normal. [16]

3. OSTRICH PRODUCTION

3.1 Incubation

Is to obtain new offspring as a result of mating parents to produce fertilized eggs (With embryos) and then maintain the vitality of this embryo after laying the egg and allow him to complete the growth during the incubation period and hatch to give a healthy chick. Hatching can also be defined as the provision of all appropriate natural conditions (temperature, humidity, ventilation, flipping, etc.) necessary for the growth of embryos in fertilized eggs resulting from successful mating during the incubation period.

Females from the black-necked African ostrich develop the first egg at the age of 18 months, while males are able to fertilize at the age of 24 months (two years).

The duration of hatching varies depending on the domestic species, and in the ostriches is an average of 42 days, twice the incubation period in the chickens where the incubation period reaches 21 days. The egg laying period then stops and this cycle can be repeated again depending on the production status of the herd.

The most important productive traits recorded for a flock of black-necked ostriches in South Africa [17].

Productivity	Average production
The length of the egg production season (today)	120
Number of eggs / mother (egg)	50
Length of egg chain (egg)	20
Fertility rate (%)	80
Hatching rate of fertilized eggs (%)	80

Source: The General Authority for Agriculture and Fisheries Affairs, State of Kuwait

<http://website.paaf.gov.kw/paaf/ershadae34.jsp>

Hatching is either done naturally (by ostriches - as happens in the wild and natural environment), or artificially using automatic machines of different capacities and sizes. Although all the farms are currently producing ostrich eggs industrially, one must give an idea of what is happening in life Wild of ostrich birds towards eggs during incubation period.

The rate of hatchability of ostrich eggs in three wild nests in Kenya was between 86.80-100%, although the hatching rate was about average 50% in the case of artificial spawning.

There is a significant variation in the weight of ostrich eggs, ranging from 350-2200 g, but most of the production of eggs is between 1300-1700 g (average 1500 g). The weight of one egg of ostrich eggs weighs 25 eggs (average weight 60 Grams) that is, one egg for ostriches sufficient for food 10-12 individuals.

In general, egg size is small at the beginning of the egg-laying season, as are modern mothers of small size and weight. The egg specifications are not suitable for hatching, where the thickness of the crust is low - less than 1 mm (while the average thickness of the shell suitable for spawning ranges from 1.7-2 mm). The ratio between yolk and white within the egg is at the expense

of low yolk, Food needed for the growth and development of the fetus.

In the mating period, one male can take care of more than one female, but to ensure the highest rate of fertilization, it is preferable to have only one female or two female females. In general, 30% of the herd is counted in the form of vaccinated males.

The incubation time for ostrich eggs varies according to species, and averages 42-43 days. It is preferable not to leave eggs for long periods without fry

Physiological needs of hatching in ostriches [17]

Physiological needs	Hatching machines	Disagreements
Duration	39 Days	3 Days
temperature	37.5 m (1 st + 2 nd + 3 rd week) 36.5 m (4 th + 5 th Week)	General note: There are many differences in scientific references in terms of reducing temperature with increasing relative humidity in the hatching machines as happens in chickens, on the other side there are some recommendations using the same rates used in hatchery machines.
Relative humidity	Ranging from 25-40% to record the percentage of loss in the weight of the egg and be within 13%	
Ventilation	- The air in the hatchery machines must be continuously replenished - 90-120 feet 3 / hour of air is calculated for each 200 ostrich eggs - this corresponds to the aerobic needs of 1000 chicken eggs - room	

to avoid the early growth of embryos in eggs. It is recommended to collect eggs at least twice daily and clean and store at low temperature Physiological zero (21 m), and the relative humidity in the range of 75-80% for a period of not more than 10 days, and then transferred eggs to industrial hatcheries. Currently, there are hatcheries and specialized hatcheries in the market for the ostrich eggs. The basic needs of hatchery (heat, humidity, ventilation, flipping) are different in ostriches compared to other types of poultry.

	temperature at 23 m and concentration of oxygen and second gas Carbon dioxide in the range of 20.95%, 0.03% respectively.	
Flipping	In the hatchery machines, eggs are allowed to be stirred once or twice / hour (depending on the type of machine). Some designs allow eggs to be stirred 4 times a day. This means that the eggs are stirred once every 6 hours with notes that the eggs are placed in the trays at 45 degrees.	But there is a consensus that the flipping will not stop completely in the hatches so that the newly hatched chick can exit without any difficulties. As in the chicken, after hatching, leave the chicks for a few hours until they dry completely and not exposed to any air currents

Source: The General Authority for Agriculture and Fisheries Affairs, State of Kuwait
<http://website.paaf.gov.kw/paaf/ershadae34.jsp>

As for nests and laying eggs, ostrich usually does the nesting of nest eggs in multiple places and environments. The nest is either in forests, grasslands, plains, grasslands or dry river paths, as well as open or open areas. The nest is usually simple and superficial with a simple hole devoid of any lining or brushes. It is often done by male (sometimes assisted by the female) and is almost in the middle of the barn or track where the male lives. The nest may be used for several consecutive years there are no environmental disasters or any other problems, and the time of laying and laying eggs varies according to geographical area.

The main female begins to lay the eggs in the nest made by the male. In addition, most of the eggs in the nest are usually produced and the minor females also lay their eggs in this nest. Eggs are usually laid after the age or before the evening.

Although the light color of the eggs and the brightness of its crust, which makes it clear to some enemies such as the Egyptian vulture, the white egg shell can reflect about 98% of the ultraviolet and ultraviolet rays that reduce the penetration of heat into the eggs [18], the presence of any embryos developing at the beginning of spawning in eggs exposed to the sun for 15 days or more and left in the nest without the care of parents.

During egg laying and even incubation, the egg loses about 2.88 grams a day of its weight. That is, for the egg weighing 1500 grams, placed in the first egg laying series, it loses about 4% of its weight until the beginning of the hatchery and control of eggs.

Many researchers have studied the temperature of the nest air and egg temperature during the period of natural hatching. The nest temperature was found to be 31.5 - 31.8 ° C, while the average length of spawning in another study was 36.1 ° C. It was also found that males maintain a nest temperature much higher than females [19].

3.2 Production systems used in farms allocated for cattle

The production systems followed by the ostrich breeders vary according to the purpose of the production activity, and the selection of each system will be determined by the capital invested and management to achieve the maximum success of the project, and one of the most important operations known to the ostrich breeder is the production of eggs and raising young people up to 3 - 4 months [20].

The following is a description of the production systems:

- Productive Families System: Under this system, one male is allocated for each female or female, and each family is raised in a separate barn. The aim of this system is to obtain fertilized eggs for the production of suitable chicks for the purpose of breeding, replacement or sale to others. This system requires large areas and high construction costs. The breeder has expertise in different fields of production, and disadvantages of this system when exposed or the presence of some reproductive problems in males, the loss is significant

because of the lack of access to fertile eggs, so you should choose males high fertility efficiency and review the proportion of fertility and the replacement of ostriches if necessary.

- Productive Productivity System: Under this production system, a number of males and females are raised in a separate barn where three males are assigned to every 8 or 10 females in a productive group. The presence of more than one male in the group increases the fertilization rate of the resulting eggs and improves the production of broiler chicks. Sometimes a fight between males, leading to the rule of the strongest male in the group and holds the largest number of females, and thus reduced the proportion of eggs fertilized.

3.3 Ostrich farms

Types of ostrich farms:

- Ostrich farms: It specializes in the production of ostriches and the raising of ostrich chicks from the age of one or three months to the age of 9-10 months (cycle of ostriches in ostriches within 10 months), where the weight of ostriches at the end of the cycle to 90 or 100 kg, the characteristics of this type of farms that With limited capital, do not require high experience, and do not need a large cost in private buildings and facilities.

- Ostrich eggs production farms: In this type of farms, breeding male and female producers to obtain eggs fertilized, may be hatched in the farm or move to other places, and these farms need large capital, a large area of land, and high technical expertise, and a large number Relative employment, high-efficiency, high-cost operation equipment and multiple facilities [21].

- Ostrich farming: In this type of farm, ostriches are raised from (1 day - 3 months) until reaching the productive stage (sexual maturity), whether male or female. This type of farms is characterized by the need for high investment for employment, large playgrounds for ostrich, a large area of land for the cultivation of alfalfa, and a relatively large number of workers, given the length of time that ostriches are found on the farm.

When starting ostrich breeding, the breeder will provide both buildings and the internal or external playground system suitable for the purpose of production and then study the costs necessary to complete the facilities and provide the required inputs and methods of obtaining the good and the appropriate price. Next, determine the numbers of the ostrich birds collected and how to obtain them from their reliable sources.

Success factors of ostrich farms:

- Obtain the ostrich's chick from a reliable source [22].
- Do not purchase ostriches from hatching eggs first or last season.
- Verify the strain type where good genetic characteristics.
- Ensure the age of birds purchased where their needs differ for the heating and the appropriate area and their needs for nutrition.
- The buildings of the barns, in terms of the location of the farm should be away from the poultry

farms and noise, and the quality of the land on which the pens and playgrounds should be level, and take into account the areas of doors and windows (the area of the windows not less than 20% of the floor area).

Do not expose ostriches to stress where stress is poorly reflected on the rates of growth of ostriches and the efficiency of conversion of fodder to meat, and the factors that lead to stress: Ostrich exposure to poor transport conditions and long distance, and the transfer of ostriches from a barn to another fold, and ostriches to noise and severe disturbance, an increase in the number of ostriches in a limited area of amber, sudden change in the quality and shape of feed, drinking ostriches for poor quality of water or thirst, as well as the exposure of ostriches to external insects and flies.

The farms located in Egypt to raise ostriches and specialized in different age stages:

- Specialized farms: include 6 to 8 capacity of 200 - 1000 chick per year, and the number of small farms capacity of 10 - 50 chick per year.

- hatcheries: from 5 to 6 large hatcheries with more than 500 eggs (500 eggs every two months), from 10 to 15 small or medium broiler capacity of 100 eggs every two months or less.

3.4 Feeding ostriches

Proper and balanced nutrition is a determining factor for the success of ostrich production projects, especially during the critical production periods of the bird's life. Food should contain the various components of protein, carbohydrates, fats, mineral salts and vitamins. Green and coarse. In addition to concentrates to avoid overheating due to excessive intake of concentrated dry feeds only. The ability and efficiency of ostriches to digest fibers is similar to that of ruminants with the difference in gastrointestinal composition.

Nutrition is the largest proportion in any animal production project, which amounts to 60 to 70%. This applies to the production of ostriches, for the largest requirements with the continuity of that length of the year, as any defect in this factor will cause health and economic problems for the project is difficult to overcome easily.

It is necessary to pay attention to the installation of the bush well and be integrated so as not to change the bird from the production of eggs to the production of fat in the body is the undesirable situation in the ostrich projects. The bush should also be appropriate in shape and size.

Adult ostrich birds feed on green leafy leaflets. One bird can eat from 1.5 kg to 3 kg. It should be free of fungus, mold or weeds and be provided to birds after cutting them so that they can be easily eaten with good mixing of fodder.

The importance of the green bush:

Green diet plays an important role in the nutrition of ostriches, as it provides some of its needs of vitamins and minerals, as provided by an important element of the food is the fiber that works to alert the movement of the digestive system of the ostrich, and also help to get rid of

the remnants of the body [23] [24]. Directorate of Agriculture - Feed Section

The best source of green clover is clover, and the best types of clover is Hijazzi (which is cultivated in desert places and reclamation lands), and the best varieties that are cultivated in Egypt are African varieties such as: Mwaba - Sonora - Mizasirsa - Sersa No.9 - Maxidor - Manador, And when water is available for irrigation, a number of cuts can be taken up to 8-9 years per year.

The importance of Hijazzi Clover is attributed to the fact that most of the cultivated fodder is of global importance and is of high nutritional importance, and the characteristics of alfalfa are the same types of perennial plants [25]. [26] [27] among its benefits:

1. Stabilization of atmospheric gases this adds approximately 80-100 kg of atmospheric nitrogen to the soil per feddan per year.

2. Improve soil properties by adding organic matter.

Intensive Care:

There are five types of feeds used to feed ostriches in proportion to age and production status as follows:

- Feed Badi:

Contains crude energy of 2500-2600 kcal / kg, crude protein 20-22%, raw fiber 5-6%, this feed is used to feed chicks from one day to one month alone, and from 2-3 months coarse feed is used by 10% % With feed starting.

- Nami Feed:

Contains energy representing 2400-2500 kcal / kg, crude protein 19-20% crude fiber 78%, and is used in feeding birds from 4-6 months with the use of alfalfa by 10% with growing fodder.

- Feeding fattening:

Contains an energy representing 2300-2400 Kcal / kg, crude protein 17-18%, crude fiber 910%, and is used in feeding birds from the age of 7-14 months with the use of clover alfalfa by 17% with fattening feed.

- Preserving fodder for off-season production:

Contains an energy representing 2000-2100 Kcal / kg, crude protein 16-17%, raw fiber 11-12% and is used in feeding birds outside the production season, with the use of alfalfa alfalfa by 16% with preserved feed.

- Produce during the mating season:

It contains 2300-2350 kcal / kg of raw energy, 21-22% crude protein, 910% crude fiber, and is used for bird feeding during the mating season and egg production, and 23% for alfalfa. In addition, some things related to food and drink should be taken into account when raising ostriches:

1. Care not to overcrowded on the scales and feed.

2. Ensure the dryness of the diet not to grow fungi on it and not exposed to direct sunlight for a long time because this leads to the loss of vitamins.

3. Mix well and not use any moldy ingredient.

4. Always use fresh veggies in front of birds, by eliminating the remaining diet without consumption when developing new diets.

5. Laying the feeds after dawn and before sunset in abundance in hot climates because the birds consume the largest amount of the bush at these two times.

6. Do not increase the temperature of the water provided about 30m.

7. Gradually change the diet and slowly if necessary change.

8. Put the chopped green juice with the other diet to encourage ostriches to consume, as well as to facilitate the passage of food in the digestive tract.

9. Put birds of equal weight at the age of 7 days together.

10. Place the gravel and small stones in front of the birds to eat them to help complete the digestion process.

4. OSTRICH PRODUCTS

4.1 Meat production of ostriches

Ostrich meat is the top of the product because of its quality and its advantage of low fat compared to red meat and white, it is almost free of cholesterol, the enemy of the heart, since the proportion of meat to fat is 99%, and the concentration of meat in the thighs that contain the best pieces of meat in birds, The ostrich is completely free of meat and is completely discarded after slaughter, and ostrich meat is similar to beef in terms of texture, taste and appearance.

Red meat is 60-63% of carcass weight, and ostrich meat is high in protein and iron and low in cholesterol, fat and energy, and is an alternative to red meat, especially for patients.

The ideal age for slaughtering ostriches is from 12 to 16 months, with a weight of 100 kg. The slaughter of birds weighing less than 75 kg is not acceptable.

- The factors that helped to attract ostrich meat:
- Halal meat slaughtered according to Islamic law.
- Type of red meat and resemble beef
- Meat fiber is soft, easy, quick cooking and easy to digest.

- Contains the lowest percentage of visible fat and the lowest cholesterol and highest iron ratio [28].

4.2 Ostrich skins

The skin of ostriches is considered to be one of the finest, highest and most expensive skins on the market. The method of skinning and separation of the skin affects the skin's rank, which is a major factor in the sale and purchase. The person performing this work must have the experience and skill in skinning the skin so that the owner of the farm has a high skin rank and may lose the validity of the skin for sale. As for the storage of leather, salts can be used at a rate of 5 kg of salt per piece of skin (ostrich) and then stored at 4 ° C.

The skin of the ostriches is the main product of the ostrich, the feathers and the meat, which is considered a byproduct of ostrich in many countries of the world.

Leather accounts for about 80% of the monetary value of the carcass and the rest is the value of feathers and meat. Ostrich birds at the age of about one year and weighing about 100 kg produces 103- 104 square meters of leather.

It should be noted that there are no specialized tanneries but attempts have been made to tan ostrich skin locally, and positive results have been reached [29].

4.3 Production of feathers of ostriches

Feathers are produced from 102-105 kg. Feathers are collected once every 12 months. The male is about 50 feathers weighing one kg at a time. Feather distribution is concentrated in the back, thighs, wings and tail. The areas below the thighs, chest, under the wings and stems are not feathers at all, and it is common to collect live birds once a year, and the removal of feathers of birds slaughtered manually and without water or auxiliary tools.

4.4 Other products for ostrich

Ostrich oil: The production of ostrich oil of about 15 kg, and uses the fat in the manufacture of some ointments used in the treatment of some skin infections and pain and inflammation of joints and muscles, as well as cosmetics, which used thousands of years ago to help increase the freshness of the skin and beauty of its ability to alleviate Dark marks, and wrinkles that appear on the skin [20].

Ostrich eggs are about 24 eggs in weight, and ostrich eggs are used in feeding either grilled, fried or boiled (2 hours boiling for maturity). Ostrich eggs have a great taste and are large enough to accommodate four people with good appetite. They weigh about 1.5 kilograms and weigh up to 120 kg. The ancient Egyptians used eggs that were not enriched after they were opened as food utensils. Today, its use in decoration and decoration is used as a work of art and drawings with patterns engraved with exquisite designs and attractive artifacts. [30]

Ophthalmic eyes: Some of the medical studies conducted on the eyes of ostriches can be used in the grafting of the cornea of the human eye, for similarity in the structure, and is currently in the world to establish specialized banks to save the eyes of ostriches so that it can be used in some surgeries, which are still in the experimental stages. [31]

What are the advantages and disadvantages of ostrich oil? What is its source?

The pure ostrich oil is taken from ostrich oil and is non-viscous with vitamin E. It contains omega-6 and omega-3, and cells can not replenish it to compensate for body deficiencies. It is effective in the treatment of rheumatism, muscle relaxant and skin softener. It helps to clean skin cells and increases hair growth. It helps to clean the skin from the signs of acne and eliminates wrinkles. It has been proven effective in the treatment of burns and eczema, and treatment of rheumatism, arthritis, cartilage, osteoporosis and painful pain in the joint [15].

5. OSTRICH DISEASES

1. 5. Diseases that are affected by ostriches and treatment [30]:

- Viral diseases
- Bacterial diseases
- Parasitic diseases
- Other diseases such as lack of vitamins and calcium and loss of appetite and lumbar types and poisoning of all kinds.

The sources of infection, which transmitted through the disease to the ostriches, including [30], [31], [32].

- Transmission of diseases from adult ostriches to young children.
- Import ostriches from infected farms.
- Other poultry farms nearby (eggs - fattening - water birds - rabbits ... etc) as well as cattle farms.
- Wild birds (called vertical infections), which leave their offspring carrying disease with ostrich pastures.
- Rodents, reptiles and insects.
- External parasites (ticks - lice - Fash ... etc).
- Unhealthy, sick and mobile labor between different farms.
- Polluted vaccines and poor care.

Prevention is better than treatment: the need for workers to clean the barn every day or day and day and collect the waste and transport off the playground to maintain the cleanliness of the bird and also the possibility of use as organic fertilizer and not leave any metals or nails or pieces of glass can reach the bird may easily swallow it without discrimination Which may cause the death of the bird, taking care not to mingle nearby workers who work in poultry farms nearby and not to enter the ostriches [33], [34], [35].

Therefore, the process of immunizations veterinary is a means of protection of ostriches, which follows the bird species in that it acquires all poultry diseases that may infect poultry, and therefore vaccinated young children of the second week of hatching Newcastle vaccine [30].

Ostrich slaughterhouse

The slaughter, processing and packing of ostriches in poultry slaughterhouses issued by ministerial decision to actively slaughter, prepare and mobilize poultry can be done manually after applying to the General Authority for Veterinary Services under the following conditions:

- Detection before and after slaughter under the supervision of veterinary doctors.
- Period of validity of frozen ostrich meat for six months until the issuance of standard specifications for this type of meat by the livestock production sector.
- Obtain a veterinary certificate approved by the veterinary medicine within the scope of the farm.
- The weight of the ostrich to be slaughtered shall not be less than 75 kg and shall not exceed one year of age.
- Slaughter is done according to Islamic law.
- Implementation of the book of animal production no. 3121 of 14/12/1998 that since ostriches can be classified under the specifications of poultry. Therefore, the process of seals and data on ostrich meat are indicated on bags of packing.

6. ECONOMIC FEASIBILITY OF RAISING OSTRICHES:

Ostrich is characterized by excellent economic feasibility for the multiplicity of products that can be sold does not depend on a single product, where the sources of income:

* The process of breeding and propagation and production of eggs - mothers - chicks.

* Meat Production - Skin - Feathers.

* Industries based on bird extracts, such as: skin industry - feathers - oil - bones - waste.

By comparing the production of ostriches and cattle production, the cow needs about 5 kilos of food, which turns it into only one kilo of meat. The ostrich needs 2 kilos of hegazi to convert it to 1 kg of meat.

A table showing a comparison of a pair of ostriches and a pair of cattle

1	Face comparison	Ostrich	Livestock
2	Production of chicks or calves	25 A break in the year	One year
3	Amount of feed	2 kg feed = 1 kg meat	5 kg feed = 1 kg meat
4	Quantity of meat produced during the year	800 kg of meat	250 kg meat
5	Price of kilo meat	EGP 250	EGP 130
6	Skin production	300 feet luxury leather	30 feet normal leather
7	Other products	Feathers - Oil - Eyes - Bones	Fertilizer - Dairy - Bone

A table showing a comparison of a pair of ostriches and a pair of cattle

6.1 Study of the feasibility of the egg mothers project in ostriches:

- The cost of establishing a herd of ostriches is 6 birds of 2 males and 4 females = 32,000 pounds.
- Calculation of feeding costs for 6 birds x 2 feeding x 30 days x 12 months = 4320 pounds.
- Calculate the resulting feathers harvested 3 times a year (6 birds x 3 = 18 kg x 100 = 1800 pounds)
- Calculation of eggs produced by mothers per year (10 eggs x 4 mothers = 40 eggs or 40 Chicks).
- Calculation of the preparation and nutrition until the age of two months (40 chick 500 pounds [the price of incubation and nutrition for two months] = 20000 pounds). Or (40 chick x 2 (daily food value] x 30 days x 6 months fattening = 14400 pounds = total cost = 20000+ 14400 = 34400 pounds].
- When the ostriches arrive at the time of marketing, the number of 40 can be calculated as follows: (40 chick x 1500 pounds per price = 60,000 pounds) 60000 the price of chicks produced 34400 Total cost = 25600 pounds Profit return during the first year and can increase during the second production year.

The economic return increases by increasing the production of eggs and increasing the total number of chicks.

For fattening birds, they are marketed at the age of 8 months and are sold to breeders at the age of two months and keep fattening for 6 months after purchase.

In order to calculate the cost of food and purchase it has a yield of 18% at the end of the period of fattening.

The economic feasibility of fattening birds can be calculated as follows:

25 fattening bird x 1500 pounds = 37500 pounds purchase value.

Calculation of nutrition costs in 6 months $25 \times 2 \times 30$ days x 6 months = 9000 pounds.

Total purchase and food costs $37,500 + 9000 = 46500$ pounds.

The yield can be calculated at a profit rate of 18% after sales at the age of 8 months.

$25 \times 18\% = 8370$ pounds [36]. [38], [37]

6.2 The most important problems of raising ostriches in Egypt

6.2.1 Professional manpower: Lack of technical manpower, expertise, doctors and nutrition experts specialized in the breeding and propagation of ostriches.

6.2.2 The capital required for investment in ostriches. The establishment of an ostrich farm for the production of ostriches consisting of 6 females and 3 males, about 100 thousand Egyptian pounds, requires fixed costs, as opposed to the variable costs of feeding, breeding and breeding of young people. About 150 thousand pounds until the production begins, and the birds reach the age of slaughter.

6.2.3 The low rate of fertility and hatching rate: increase the mortality rate of chickpeas from hatching until the age of 2-3 months, and the low rate of growth and problems of foot-wrap in young age, and finally difficult to market the final products of ostriches, and the most important reasons for the decline in the proportion of eggs enriched Male fertility, nutrition and egg contamination before and after the hatchery, and to overcome these problems must be made sure that the males mature sexually, where it is difficult to estimate the age of male after the change of feather color to the distinctive black color of the male (at the age of a year under the conditions of Egypt). Therefore, the source of purchase must be made of the age of males. The male is about two years old (redness of the beak and the front skin of the legs and dancing characteristic of sexual desire), but the male is not fertilized until the age of 4 years.

The most important factors affecting the law hatching rate and the rate of early and late death is the temperature of the hatchery (36.4°C) and the percentage of moisture (20-25%) and depends mainly on the percentage of weight loss during the incubation period or 39 days and then transferred to the hatchery For about 4 days), flipping (about 6 times daily at 90° angle), ventilation rate and pollution, and the most important problems that have been shown to affect early and late death of the fetus. Coli. A number of infected eggs were analyzed during the incubation period and newly hatched chickpeas, which did not absorb the sack. Which is found to be sensitive to the treatment of amoxicillin and gentamicin, so it is recommended to ensure that the eggs are cleaned well after the collection immediately and before entering the hatchery and should be cleaned of the hatchery after each session, and give a preventive dose of Amoxicillin for three days after

starting to feed Young children (about 4 days or more after hatching).

6.2.4 Death occurs due to lack of adequate heating, where the temperature should not be less than 25°C at night. Otherwise, the resistance of the bird will be reduced to various diseases, [6] and death due to cholestyridium.

The problems of torsion of legs are often due to problems in the incubation, so be sure to adjust the temperature and humidity in the hatchery or problems in nutrition, where it must cover the nutritional needs of protein and mineral element and vitamins and balance between them, and after many scientific research access to the relationship, the requirements of ostriches are not covered, nor do they cause problems of sliding ligaments, and lead to the best growth rates, taking into account that the fish powder may lead to the destruction of the lining of the quince. It is also recommended not to use animal protein in the feeding of ostriches at any stage of growth.

As for the death of the embryo in its initial stages of development, at high temperatures, the cells inside the egg may begin to divide without incubation of the eggs by the mother, which destroys the embryo inside the egg, thus no hatching occurs.

6.2.5 Suitable playgrounds for raising ostriches: There should be suitable breeding grounds for ostriches at different age levels. The preferred education is on cement floor with half covered and half covered playgrounds, with well-ventilated and heated sleeping areas and suitable bedding. Place rice straw or hay in small ages so as not to lead to death due to intestinal infection) until the age of 3-4 months depending on the temperature of the atmosphere during the cold weather, but the area of the stadium is less than 5 m^2 / bird and prefer rectangular playgrounds and increase the area to 20 m^2 For each bird up to the age of 10 months or marketing, which does not require in this case places covered or Places to stay, but umbrellas must be provided with an area of about 10%.

The most important thing to keep in mind during the breeding period is to free the playgrounds from any foreign bodies, especially the broken glass, wires or shiny objects, and provide clean fresh water (salinity does not exceed 1,000 ppm), with water changing as the temperature rises, feeding on fodder Green, such as clover and lettuce, to be cut into small, age-appropriate parts with partial drying of the alfalfa, in addition to dry feeds.

Ostrich's prefer green pots for water and food, and do not favor blue or red. A quantity of gravel should be available to fit in size with the size of the big finger nail, depending on the age of the bird, which helps to grind the food in the quince. Afternoon to sunset).

And provide a similar area for breeding for the purpose of fattening within the area of acres of land for 30-40 birds, and the existence of a parachute area of 30-50 square meters / fed under the tires placed by feed and old buildings to watering birds, so as to heat the feed and

water by the temperature of the sun, Affects the health of the bird.

The establishment of the farm will also consider the possibility of future expansion in terms of land area or building designs, considering that the farm accepts continuous growth as a result of the success of the project, especially when producing products that are famous for the farm in the market at the start of production. National income, the provision of hard currency, the promotion of tourism and the utilization of desert lands.

6. 2. 6. Marketing Problems: So far there is no Egyptian market for ostrich products so that the producer can sell its products according to supply and demand. The breeders depend on the companies supplying the marketing of the final products. The local market should be encouraged and standard specifications of meat, skin and ostrich feathers produced in Egypt should be established. Export of these products, with the need to create a market for ostrich products through information campaigns and work to provide high quality products and disseminate information about these products in various ways and means for both the consumer and the producer at the same time, owing to the high capital costs of the infrastructure of the ostrich industry from the costs of production and processing of feed, slaughterhouses, tanning and manufacturing of finished products, an economically viable regulatory framework such as cooperatives or producer associations must be established, based on the adoption of specialized production and marketing units and the production and marketing integration processes between the producers themselves [21].

6.2.7 Ostrich massacres: One of the most important problems of the spread of ostriches is the absence of massacres licensed to slaughter, which has already started more than an investor in the extraction of licenses required, and was the establishment of a licensed abattoir meets the health conditions, and also attention to dandruff is the second most important producer of ostriches and its manufacture in Image of luxury leather products, many attempts are now underway to get to that rather than exporting raw skin.

6.2.8 Lack of scientific research: To encourage scientific research in the nutrition, breeding and reproduction of ostriches by establishing scientific centers specialized in scientific research, in training breeders and producers, and to cooperate with them in solving the problems facing them. It is worth mentioning that an oasis farm And a scientific training center for ostriches and methods of breeding and production in the Faculty of Agriculture, Al-Azhar University, as well as provide scientific and guidance publications for educators, producers and investors in the ostrich industry.

6.2.9 The role of workers in ostrich farms: The interest of workers in providing feed and water per day for birds, while calculating the rate of consumption of birds for feed, which ranges from 1.5: 2 kg per day, if less than the limit can be a pointer to the health disorder of the bird.

The workers should keep the neck from the bottom of the head directly, leading to the suffocation of the bird or breaking his neck, and also to the eyes of the bird with a special sock where the bird can be controlled when blocking vision, and should not try to catch the bird by force if the bird is raised and difficult to control, it must be left to calm down.

6.2.10 Problems of low fat in slaughter ostrich: One of the most common problems that meet ostrich breeder to obtain meat is the complaint of the belly fat layer, where the thickness is not more than 0.5 inches (12.7 mm), noting that the normal fish must be From 1 to 1.5 inches (38 mm). The reason for this may be in the exposure of birds to exertion or stress during the day, which accelerates the lack of fat, as the breeder works to reduce the rate of nutrition is not enough food for the birds need for energy and maintenance of life, or the breeder is working to reduce the rate of nutrition and the food provided to the birds is not enough for energy and maintenance of life, or that the breeder provides birds with an imbalance and does not contain the necessary nutrients, when feeding the birds, be sure to provide the diet quantity and quality required within 24 hours the least.

6.2.11 Problems of meat production and specifications of good bird: The problems facing the product are how to reach the specifications of the production of meat to get a high price.

6.2.12 Nutrition problems low nutritional value: birds require continuous follow-up, even after the introduction of the recommended courses and follow-up continuously, if it is still weak, the daily amount should be adjusted upward, and if the results are clear must be changed to a different slide Of the diet (nutrition) with a higher percentage of protein, as the protein enters the formation of cells and immune bodies and hormones, and lead to a decline in antibodies to diseases, and reduced the ability of the bird in general to the effects of feathers and color protein deficiency.

6.2.13 Problems related to the damage of wild birds (in fattening farms): harmful wild birds, the most important of which are the Nile birds and migratory birds of the country from central and southern Europe to escape the cold of winter and in pursuit of food. These birds are avid to eat food such as starlings, And the problems caused by these wild birds to eat very large quantities of grain from the fodder found in the outside, so the remainder of the feed does not represent the balanced diet needed by the chicks.

6.2.14 Nuisance and stress: In young ostriches appear stress as a result:

- The intensity of overcrowding and overcrowding.
- Changing the ocean around her suddenly move her to a new place.
- Sudden change in the quality of the diet.
- Education system.
- Excitement or pain due to a condition in the abdomen.
- The presence of external parasites [32] [39] [38].

7. CONCLUSION

- The agricultural development in Egypt and the serious attempts to develop agriculture in all fields, including the field of agricultural investment in general and investment in the field of animal production in particular, which led to the spread of ostrich farms in Egypt, for example, production farms and ostrich breeding in the areas of reclamation West of Nubaria, on both sides of the Egypt-Alexandria Desert Road, Ismailia Desert Egypt, the Belbeis Desert and the Upper Egypt, and Toshki and East 'Awainat.
- The ostrich is the largest modern bird on the face of the earth and belongs to the group of birds that can not fly, but it is famous for its speed in running and called the Arabs with camel birds because of the size of his body and the length of his neck and ability to live in the desert and semi-desert, and ostrich is primarily a pastoral bird falls under the platoon Grasses are not birds of prey.
- The breeding and production of ostriches has gone through stages. The interest in feathers and then in skins and then increased attention to meat, which is considered to be one of the best red and white meat, because of its low cholesterol, calorie and sodium content. The Arabs considered it a supernatural meat and it cured many diseases such as rheumatism On the healing of the wounds of the bodies that cared about the raising of ostriches in Egypt, the Ministry of Agriculture and scientists at Suez Canal University and the Faculty of Agriculture Kafr El-Sheikh and the National Center for Agricultural Research.
- Egypt has been interested in studies on nutrition and sent veterinarians for training in the farms of South Africa to supervise the new ostrich farms in Egypt, and the number of ostriches in Egypt more than a thousand ostrich and its age does not exceed 8 years of the price of one of them between 2-16 thousand pounds depending on production and age.
- Egypt is considered one of the best places to establish the industry economically for the availability of the sun, as well as low humidity, which is dangerous to the young - in addition to the production of Alfalfa Hijazi most of the season, which starts from March to November.
- Egypt has started to raise ostriches in Egypt as a recent economic project a few years ago and on scientific bases in the field of propagation and production of ostriches by establishing the first ostrich production company as a joint venture between Egypt and Saudi Arabia in Ismailia.
- The company works to produce improved breeds and supply them to the market and buy the product from other farms to market it and have a role in transferring the experience to new investors in order to help to expand the advancement of this industry, followed by one of the companies specialized in raising mothers such as the Egyptian Company for breeding and propagating ostriches.
- Currently, there are 4 companies in Egypt working in the field of propagation of ostriches and was licensed by the Ministry of Agriculture, where it is not necessary to establish the farm is the availability of sandy areas and distance from agricultural land not suitable for education.
- And all the advantages enjoyed by Egypt calls for the expansion of this industry so that Egypt can compete in the global market, where some countries in the Middle East to reach high rates in the production of ostriches and developed their production became an ostrich chick gives at the age of 6 months about 100 kg of weight and not after a year of breeding. It also managed to increase the amount of meat and shorten its legs.
- The South African country has monopolized the production of ostriches for about 150 years. It used to raise natural feathers for feathers. Then the production systems developed to include other ostrich products. Finally, global attention has begun to establish farms for cattle in some countries, including Egypt. This is due to the high rate of return to invest in its field compared to other projects.
- The consumption of ostrich meat is new in Egypt because consumers do not return to it, which requires some time to get used to consumption, in addition to the higher selling prices locally compared to the prices of the sale of red meat, such as cattle and sheep, and demand for ostriches meat is limited to visitors to hotels and restaurants.
- As evidenced by the many types of ostriches, depending on the color of the neck, and the variety of systems used to raise ostriches in Egypt.
- Ostrich farming has more than one system, and can work more than one breeding system within a single farm. Several important things must be taken into account when starting a project, including farm size, location, climate, and funding.
- The management is one of the most important factors that work on the success of any farm, along with the calculation of all the necessary components, and study the structure of the functions and tasks assigned to each worker with the knowledge that ostrich farms do not require many labor.
- It should also be noted in the end for anyone who wants to raise ostriches that the best systems of ostrich farming is a single male trio system with two females.
- In addition to all the above, attention should be paid to some important points when carrying out an ostrich breeding project:
 - Leather tanning must be kept in accordance with international export standards.
 - Slaughter and prepare Ostrich meat and sell it at different outlets and pay attention to its production according to international quality standards.
 - Establish industries to make the most of ostrich feathers and grease.
 - The interest in studying the most suitable and lowest priced nutritional structures to provide appropriate

- rations for the Egyptian and the different Arab regions on the basis of scientific basis.
- Solve the problems of low fertility, by providing high-quality strains guaranteed production, and treatment of diseases affecting fertility and provide appropriate rations.
 - Pay attention to the training of technicians in the establishment of farms and breeding and care of ostriches.
 - To solve egg incubation problems by working to provide local or imported hatcheries at suitable prices and training on how to use them.
 - Solving marketing problems by developing ostrich products and establishing a consumer market for these products.
 - Construction of the infrastructure of the ostrich industry.
 - Establish an association of ostrich producers in each region to regulate the production market for cattle.

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