



## Alligator Production in Florida<sup>1</sup>

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American alligators (*Alligator mississippiensis*) have long been popular for their skins and meat. Alligators were hunted in Florida as early as the 1860s to provide leather belting for industry and boots for the military, and the first alligator farm was established as a commercial enterprise in 1891. However, in recent years alligator farming has received renewed interest as a growing aquaculture industry. This is especially so in Florida where 42 alligator farms are now licensed by the state.

Alligator farming as a bona fide agriculture industry has several distinct advantages. It offers farmers the chance to produce high priced products year-round, for a national and international market that is less than 50% saturated. Alligator farms do not require large tracts of land or water, and farm operations do not have major adverse effects on the environment. In fact, alligator farming benefits wetland conservation. With the Florida Game and Fresh Water Fish Commission permit, alligator farmers may stock their farm with hatchlings collected from private wetlands. Payment for these hatchlings provides income to owners of wetland habitat that in the past would be of marginal agricultural use without drainage. Allowing the owner to earn income from selling hatchlings provides direct economic incentive for maintaining wetlands.

Unlike more typical livestock, alligators are carnivores that must be fed animal protein; approximately 400 pounds of protein are needed to grow an alligator to 6

feet in length. However, alligator farming offers an efficient way to utilize meat and meat products which are not suitable for human consumption. Aged or freezer-burned meat from the human market, unused fish from commercial trawlers, and offal from poultry processing plants are a direct source of food for several alligator farms. In addition, artificial pelleted feeds are being developed as an alternative to fresh or frozen meats.

With the increased interest in commercial production of alligators, the need for more research, for improved husbandry methods, and for strengthened marketing operations has become apparent. This includes a better understanding of alligator growth and reproductive physiology, new techniques for increasing the number of hatchlings produced on the farms, methods of promoting more rapid growth, prevention of disease, improved preparation and marketing of hides and meat, and the development of new products.

Female American alligators breed between March and May. Egg laying occurs during June and July, with hatching in August and September after approximately 65 days of incubation. The sex of the hatchling is determined by the temperature at which the eggs are incubated; incubation temperatures below 86 °F produce all females, and temperatures above 93 °F produce all males. The ideal temperature for producing both sexes is around 88 °F. Female alligators must mate each breeding season in order to lay fertile eggs. Follicles that are not ovulated during a

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breeding season are reabsorbed. Ovulated follicles are fertilized and travel via the oviduct to be laid 45 days later. All eggs are laid at one time, and the average clutch consists of 30 to 40 eggs.

## The Market

Twenty years ago, 5,000,000 crocodilian hides were traded each year on the international market. Today, an estimated 1,500,000 crocodilian hides are traded annually on the world market, approximately 300,000 of which are classic full belly hides of alligators and crocodiles. Florida, Louisiana, and Texas currently produce a combined annual total of approximately 45,000 wild and farmed alligator hides. The licensed alligator farms in Florida produce approximately 7,000 hides a year, but production is expected to double in the next 3-4 years. If production expands by 10% annually, by the year 2000 A.D. over 20,000 hides will be marketed annually by Florida farms. The current value of raw products, hide, meat, bones, from a 6-7 foot alligator is more than \$300. The value of the finished retail products is in excess of ten times the raw product value. Finishing and merchandizing alligator products offers the opportunity for major industry.

Demand for alligator hides and meat is well established in North America, Europe, and Japan and doubtless will continue in the future. New legislation permits the sale of alligator products in most states. This should allow the hide market to increase at an annual rate far greater than the 10-15% projected in the estimates.

## Farms Needed

The ability to market 100,000 alligators would require from 40 farms producing 2,500 alligators each year to 80 farms producing 1,250 alligators each year. Those who are interested in establishing an alligator farming operation are advised to have a thorough knowledge of the business and method of operation before committing themselves and their capital to this enterprise. Specific areas one should have knowledge of are:

- a) state and federal regulations
- b) land requirements
- c) building requirements
- d) operating expenses
- e) marketing methods
- f) handling and harvesting of alligators
- g) supply sources for food and equipment

- h) long and short term financing

Research is now in progress to improve and expand the technological tools available to the farmer. Investigators have research projects focusing on reproduction physiology, nutrition, and methods to increase the hatch rate of alligator eggs. Research on an artificial breeding program is in progress at the College of Veterinary Medicine, University of Florida, and shows promise in assisting a self-sustaining alligator industry.

Alligator farming is not a "get rich quick scheme" but rather one which requires careful planning and dedication to the principles of quality agricultural production.

## Methods of Operation

There are two different approaches to captive production of alligators, farming and ranching. Farming is a completely integrated, closed-cycle operation which maintains adult breeding stock to produce all the eggs needed. Following laying, the eggs are collected, artificially incubated, and the hatchling alligators are then raised to a market size of between six and seven feet.

Ranching is an open-cycle system (similar to a cattle feedlot operation), which does not maintain adult breeders or produce its own stock. Eggs or hatchling alligators are collected from the wild under permit from the Florida Game and Fresh Water Fish Commission, or purchased from a farm specializing in the production of hatchlings. These are then released to marketable size. Both ranching and farming operations are found on most licensed alligator farms.

During their first year, alligators grow fast, converting approximately 50% of the food they consume into increased weight. By their third or fourth year, alligators slow down to the 10% conversion rate typical of cattle. In cold weather, alligators become dormant or inactive and do not grow. To obtain the maximum growth in the shortest period of time, alligators being reared for market should be kept warm (86°F) indoors under a controlled environment. It is possible to rear alligators for the market in unheated outdoor pens but the time needed to reach market size is considerably longer and under most situations is not recommended.

Breeding herds are best kept outdoors in breeding ponds where the cool temperatures and short day length of winter triggers reproduction in the spring. A natural

environment, combined with proper nutrition, serves to maximize breeding efficiency.

Alligator farming as a commercial enterprise is most suited for the Southern United States, the natural range of the alligator. However, it is feasible that with the correct facilities other areas may be adapted to a growout enterprise.

Alligator reproductive rates on the farms have not reached the efficiency found in the wild population where 80% of the eggs hatch. However, records from present-day farms indicate that 70 percent of the females will nest each year and average 35 eggs per nest with a 30 percent hatching rate. Therefore, a breeding herd of 150 females and 50 males will produce approximately 1,100 hatchlings a year. These hatchlings should reach a length of six to seven feet within 36 months of age. If the mortality rate does not exceed 10% over the three-year growth period, then 1,000 marketable alligators should be harvested each year after the third year of operation. In a heated growout enclosure, the food consumption will be approximately 30 pounds of meat per alligator during the third year. By comparison, each adult in the breeding herd will consume approximately 400 pounds of meat a year.

## Conclusion

Operating an alligator farm is very expensive. Large capital investments are required over a period of three to four years when no income is generated. Because of the newness of the industry, there is not certainty that the production methods used will achieve the goals desired, though the methods are improving each year.

In the alligator industry, there appears to be potential for making considerable money, provided production efficiency is improved and costs are minimized. This will necessitate incorporating improved technologies. Every effort must be made to significantly increase reproductive rates, and to selectively breed animals for fast growth and improved feed conversion rates, and for good hides and meat. At the same time, continuing efforts must be made to keep operating costs low.

While there appears to be opportunities to make money, it must be recognized that producing additional quantities of meat and hides may depress world prices unless efforts are made to develop new markets for existing products and to develop new products. This is especially true for alligator meat. While present markets exist for all available meat, the average American consumer is not accustomed to eating alligator meat, so market development activities may have to be undertaken to ensure adequate future demand at a good price. For hides, a large market exists, although some market development may be necessary to ensure continued good prices.