Discussion – Dec 2 & 3

- Meat Laboratory Cole Facility Building "C" 162B
el lagarto, Spanish for “the lizard.”
• Crocodiles
  – ~ 15 species
  – including American crocodile (endangered)

• Alligators
  – Wide U-shaped head
  – fourth lower tooth resides inside notch in upper jaw
  – freshwater only
  – two species; American & Chinese
  – related caimans
  – biggest recorded alligator; 1,043 lb ♂️, ~14 feet in length
American alligator

(*Alligator mississippiensis*)
History -

- 1800 ✓ Commercial harvest of skins
- 1891 ✓ First alligator firm established in Florida
- 1900 ✓ Wild harvest = 150,000 hides
- 1960’s ✓ Most states ban harvest of wild alligators
  ✓ U.S. Fish & Wildlife Service places alligators on the “endangered list”
- 1973 ✓ Alligator populations rebound
- 1980’s ✓ States develop sustainable management programs including farming
- Today ✓ 1 million wild alligators in Florida alone
“threatened for reasons of similarity in appearance”

1983 - Classification under the Convention on International Trade in Endangered Species (CITES) treaties. Meaning the sale of products must be regulated through tagging & documentation so that products from other crocodilian species that are endangered are not sold illegally as American alligators.
Louisiana Fish & Game –

- Wildlife should pay for itself philosophy
- Extensive research at Rockerfeller Wildlife Refuge at Grand Chenier, Louisiana

- geothermal - western U.S.
- illegal in California
Optimal and tolerated levels of some water quality variables for the American alligator, *Alligator mississippiensis* (Masser 1993).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Optimal Level</th>
<th>Tolerated Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salinity</td>
<td>slightly brackish</td>
<td>-</td>
</tr>
<tr>
<td>Temp. - growth</td>
<td>29 – 33 °C</td>
<td>7 – 35 °C</td>
</tr>
<tr>
<td>no growth</td>
<td>&lt; 21 °C</td>
<td>&gt; 34 °C</td>
</tr>
<tr>
<td>stress</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temp. – development</td>
<td>24 – 33 °C</td>
<td>-</td>
</tr>
<tr>
<td>Hatch 65 days</td>
<td>&gt; 29 °C</td>
<td>-</td>
</tr>
<tr>
<td>Humidity of nest</td>
<td>94 – 99%</td>
<td>-</td>
</tr>
</tbody>
</table>
Reproduction

Sexual maturity

- Culture = 3 – 4 years
- Wild (Louisiana) = 9 – 10 years
- Wild (North Carolina) = 18 – 19 years

Egg collection

- Special permit regulations – LA, TX, FL
  - ~ 300,000 eggs/yr; value 1.8 million $
  - hurricane damage to nesting habitat; egg supply ↓
- Industry also uses eggs from domestic stock
Broodstock Culture

• Pens = ~ 1 ha in size; 6 ft fences, buried 1 ft, no 90° degree corners.
  – breeding pond = 2 m deep x 15 m wide and shaped in the form of “M, S, W, or Z”; ratio of land to water 3:1 - housing a breeding population of 20 - 30 animals with a female to male ration of 3:1.
  – nesting pond - 7 x 15 m for nesting females; females build nests of grass; under best condition 70% of females nest each year with a clutch size of roughly 40 eggs.
Hatchery Culture -

- **Egg collection** - collect eggs in the first 24 hr of being laid; mark position; umbilical cord of embryos in eggs easily damaged.

- **Incubation** = 65 days if temperature ~ 29 °C; eggs surrounded by 2 inches of nesting material, bacteria of rotting grass helps in the breakdown or the shell. Temperatures at or < 30 °C produces all ♀; > 33 °C all ♂

- **Hatching** = After 15% have hatched and are “chirping”, remainder hatched by hand; care must be taken not to damage umbilical cord; ~ 90% survival; hatchlings maintained 32 °C to promote yolk absorption; hatchlings start to feed on the third day.
PETA –

- alligators are ‘factory farmed’ for their skins.
- Kept in half-sunken tin-sided structures of cinder blocks on concrete slabs.
- As many as 600 young alligators may inhabit one building.
- Dark, reeking of rancid meat, alligator waste, and stagnant water.
- Although alligators may naturally live 40 to 60 years, on farms they are usually butchered before their fourth birthday.”
Growout -

Typical alligator grow-out facility, 10 x 15 to 25 m
<table>
<thead>
<tr>
<th>WATER</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DRY</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISLE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>WATER</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Drain trough with covered grating
- Warm water refill

Water surface area on Louisiana farms varies from 50% to 90%
Growout -

- Indoors - heavily insulated building with controlled lighting
- Temperature = 30 - 31º C (86 - 88 ºF) for optimum growth
  - below 21 ºC no growth
  - above 34 ºC severe metabolic stress & death
- Space -
  - .3 sq. m per animal until .6 m (2’) in length
  - 1 sq. m per animal until 1.2 (4’) in length
  - 2 sq. m per animal until 2 m (6’) in length
- Lighting - near or total darkness except for feeding and cleaning times.
- Soft music
Feeding -

• commercial pellet (50% protein)
  nutria and other waste meats
• feed am/ clean p.m.
• feeding rates
  – hatchlings = 25% of body weight/wk
  – 6 ft adults = 18% of body weight/wk
• feed conversion = 2:1 (hatchlings)
  = 3:1 (6 ft adult)
Growth = 2 – 3”/month market size in < 2 years

<table>
<thead>
<tr>
<th>Length (ft)</th>
<th>Weight (lbs)</th>
<th>Value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>3 (typical)</td>
<td>9.5</td>
<td></td>
</tr>
<tr>
<td>4 (harvest)</td>
<td>20.0</td>
<td>~ 80</td>
</tr>
<tr>
<td>5 (size)</td>
<td>44.0</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>55.0</td>
<td>~ 300</td>
</tr>
</tbody>
</table>
Mortalities -

- 2 - 5% first yr; < than 1%/yr thereafter
- Problems of poor management include:
  - Heat stoke of adults - lack of shade in breeding pens
  - Bacterial infections - *Salmonella* sp. and *Shigella flexneii* - poor cleaning or fighting at feeding tray; treated antibiotics - prescribed by a veterinarian
  - Suffocation - piling juveniles when frightened
  - Stunting - caused by stress and/or overcrowding; lack of size segregation
  - Poor nutrition
Nutritional diseases -

- gout – uric acid crystal deposition at the joints due to overfeeding of protein-rich diet
- diarrhea - oily fish causes diarrhea;
- steatitis (fat necrosis) - vitamin E deficiency
- reproductive failure - vitamin E deficiency
- intestinal blockages - overfeeding fur
- rickets - calcium deficiency caused by a meat only diet
- vitamin K deficiency - causes teeth to fall out
Production Costs -

- Breeding adults = > $ 500 each (~ $ 15,000 - 20,000 for a breeding herd of 30 adults)
- Hatchlings = generally sell from $ 20 - 30 each
- Heating = ~ 1,000 BTU per 100 sq. ft per year (estimated) for Northern Florida
- Feed = commercial alligator feed ~ $ 500/ton (25 cents/lb) before shipping; nutria ~ 20 cents/lb; 6 ft farm raised alligator weights 55 lbs and thus requires 110 lbs of feed at a 2:1 feed conversion ratio (> $ 27.00 in feed)
- Overall cost = ~ $ 20.00/ft for a 6-foot alligator in Louisiana - $ 120/alligator
Marketing – Hides

- Must be at least 4 ft in length
- Major hide buyers
  - U.S. = 33% → resale
  - France = 21%
  - Followed by Italy - 20%, Singapore – 19% and Switzerland, Mexico & Germany (total 5%)
- Price varies dramatically with economy of importing countries; $ 35.00/ft in 1990 to around $ 20.00/ft. in recent years.
Processing -

Farmed hides are preferred!

- Killing done carefully so as not to damage hides. Approved methods; bullet (typically with a 22 caliber silenced rifle), captive bolt or cutting the spine at the back of the head with a hatchet and then destroying the brain by inserting a rod.
- Bodies are then refrigerated overnight
- Following day, air is blown under the hide to separate it from the carcass and skinning completed.
- Hides scraped to remove all flesh and salted down
- Most states require written approval and tags from a state regulatory agency. Careful tracking of farmed product prevents poached hides from entering the legitimate market
Hide sales
- 1985 = 6,000 hides
- 2005 = 1,300,000

Note: 1900, the height of the wild harvest, total was ~ 1/10 this amount (150,000 hides)
Average price $ 25.40/hide
- 2010 = Down significantly
  due to failure of luxury goods markets??
Exotic Hide Industry -

Alligator Farmers

Tanneries (10 or 15 independent, family-owned)

Fashion Houses
Hermès*, Gucci and Cartier

✓ Hermès “Kelly” bag = ~ $ 18,000 alligator
✓ Hermès “Kelly” bag = ~ $ 25,000 croc (Australian)
Is Hermès manipulating the alligator farming industry?

- Luxury market down 25%
- Oversupply from previous bumper crops
- Last 10 years Hermès buying tanneries
  - Hermès now the largest player
  - Buys about 1/3 of Florida’s alligator hides
  - Sales of tanned hides rising
- Hermès still buying from farmers
  - “to support them in these difficult times and to respond to Hermès increasing development in alligator skins”
  - Hermès only paying ~ $ 20/ft
- Hermès owns one large Florida alligator farm
- Hermès buying crocodile farms in Australia
Consolidation -

Number of Alligator Farms Selling Skins -
LA and FL Combined

Year

1985 1987 1989 1991 1993 1995 1997 1999 2001

Louisiana = 14; Florida = 11; Texas = 3; Georgia = 2
Global market -

- Variously estimated to be 500,000 to 2,000,000 skins per year
- Varies depending on the general world economy & fashion whims
- Global harvest of wild crocodilians most likely at a maximum ~ 150,000 skins for all species
- Crocodile or caiman farming also being attempted in numerous other countries; total worldwide population of crocodilians on farms is estimated to be ~ 1,000,000
- World population growth would seem to ensure continued growth of the industry
- Potential impact of animal rights groups is uncertain
Industry Image Marketing

- Sustainable –
  - funds generated from egg collecting encourage owners of marginal swamp land not to develop
  - funds to state agencies for egg collecting and tags go back to wildlife management
  - Return of percentage (12% in Louisiana) of alligators to the wild in return for collecting eggs increases populations
  - Availability of farmed product reduces poaching
Meat -

• Can provide 30% of producers income
• De-boned yield for 6 ft alligator
  ✓ Tail = 16% dress out
  ✓ Leg = 5% dress out
  ✓ Torso = 10% dress out
  ✓ 1.3 million lbs in 2005 (26 farms)
• $2.15/lb wholesale;
• Market development needed
  ✓ Low in fat and high in protein
And, of course, souvenir shops!

Farm raised alligator heads sell for around $35 to $500 dollars, depending on the size of the head.
Additional Information

myfwc.com/wildlifehabitats/Alligator_farming.htm


http://www.agmrc.org/commodities__products/aquaculture/alligator_profile.cfm