Rabbit Production
“Tastes like chicken!”

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USDA once proclaimed rabbit meat to be...

“the most nutritious meat known to man.”
Domestic rabbits

*Oryctolagus cuniculus*

- Order *Lagomorphia*
  - Are not rats!
  - Are different from hares

- Descend from European wild rabbits
  - Some behavior similarities
  - Some behavior differences

- Selective breeding of rabbits began in the Middle Ages (before 16th century).

*Domestic and wild rabbits cannot interbreed.*
Rabbits are a multi-purpose animal.

- Meat
- Wool
- Fur (pelts)
- Laboratory
- Hobby
- Pets
- Show
- Manure

Californian doe at Garrett College
How many rabbits in the U.S.?
We don’t know. In 2000, USDA estimated there to be 9 million.

- 5 million pet rabbits
- 2 million rabbits harvested for meat
- 1 million rabbits raised as 4-H/FFA projects
- 930,000 rabbits raised by hobby breeders
- 250,000 rabbits used in research

Compared to 8 billion chickens!
Rabbits in the world

- **China**
  21% of production

- **European Union**
  54% of production
  - France
  - Italy
  - Spain

- **Developing countries**
  - Subsistence agriculture
  - Economic development

- Considered “pests” in Australia and New Zealand.

Trinidad and Tobago
Rabbits vs. poultry: similarities

- Small livestock that do require a lot of land or investment.
- Not difficult to handle.
- USDA does not require inspection of small-scale poultry slaughter or rabbits.
- Slaughter regulations in Maryland are the same for small-scale poultry and rabbits.
- Produce healthful, low-fat white meat.

Proper way to hold and carry a mature rabbit.
Rabbits vs. poultry: differences

- Different biology
  - Anatomy
  - Digestion
  - Reproduction
  - Behavior

- Very small industry
  - Mostly pets and hobby
  - Few approved drugs.
  - Rabbit is not a widely consumed meat.
    - “Easter bunny syndrome”
Talk like a rabbit producer

- **Doe** - female rabbit
- **Buck** - male rabbit
- **Kit (kitten)** - baby rabbit
- **Kindling** - giving birth
- **Fryer** - market rabbit that is 8 to 10 weeks old and weighs 4-5 lbs.
- **Cuniculture** - raising of rabbits.
- **Hole** – production unit
Breeds

The Californian and New Zealand (White) are by far the most popular breeds for meat production.

**Californian**
(Himalayan x Chinchilla x New Zealand)
medium size, 9-11 lbs.

**New Zealand**
(white, red, black, and broken varieties)
medium size, 10-12 lbs.
Other breeds used for meat production

<table>
<thead>
<tr>
<th>Breed</th>
<th>Size</th>
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<tbody>
<tr>
<td>Altex (composite, sire)</td>
<td>&gt; 13 lbs.</td>
</tr>
<tr>
<td>American Chinchilla</td>
<td>9-12</td>
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<tr>
<td>Champagne d’Argent</td>
<td>9-12</td>
</tr>
<tr>
<td>Flemish Giant</td>
<td>13-14</td>
</tr>
<tr>
<td>Florida White</td>
<td>4-6</td>
</tr>
<tr>
<td>French Angora</td>
<td>7 ½ - 10 ½</td>
</tr>
<tr>
<td>Palomino</td>
<td>8-11</td>
</tr>
<tr>
<td>Rex</td>
<td>8 - 10 ½</td>
</tr>
<tr>
<td>Satin</td>
<td>8.5-11</td>
</tr>
<tr>
<td>Silver Fox</td>
<td>9-12</td>
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</tbody>
</table>
Raising rabbits for wool: Angoras

Four kinds of Angoras

1. English: 5 to 7 ½ lbs.
2. French: 7 ½ to 10 ½ lbs.
4. Giant: 10 lbs. and up

Harvesting the fiber

- Pluck during molt or every 10-11 weeks or shear (with scissors) every 10-11 weeks (Giant Angora).
- Average of 15 ounces per year
Any breed is suitable for show, hobby, or pet.

- The American Rabbit Breeders Association (ARBA) currently recognizes 47 unique rabbit breeds.

- Some breeds have several or numerous varieties, e.g. Netherland Dwarf has 25 varieties.

- The breeds have many fur, body, and ear types and range in weight from 2 (Netherland Dwarf) to over 13 lbs. (Flemish Giant).
Housing options

Outdoor hutches vs. indoor cages

INRA rabbit research farm in Toulouse, France
Housing options
Colonies vs. individual cages

INRA rabbit research farm in Toulouse, France
Housing options
Pasture vs. cages
Housing options (fryers)
Feed lot vs. cages

Rabbit “feedlot” in Trinidad

Fryers at Garrett College
General cage recommendations

Size
- ¾ square feet per pound of mature body weight
  - e.g. 30" x 30" (or 36") for commercial Doe
- 18 inches high

Wire
- ½ x 2 in. wire on sides
  - Options: “baby saver” wire or urine guards
- ½ x 1 in. wire on floors
- Solid floors

Does in Garrett County
Additional cage needs

- Grow-out (or bigger cages for does and litters)
- Junior does and bucks (replacements)
- Breeding bucks
Accessories

- Feeders
- Watering
- Nest boxes
- Resting mats
- Animal identification
- Record keeping
- Carrying cages

Automatic waterer with flexible tube
Feeders

Pelleted feed
- Crock
- Dishes
- Cups
- Pans
- Hoppers (e.g. Fine-X®)
- Creep feeders

Hay
- V-shaped
- Hopper
- Between or on top of cages.
Watering

- Manual - receptacles
  - Dishes, pans, crocks, bottles
  - Purchased vs. home-made

- Automatic
  - Gravity-fed
  - Rigid or flexible tubes
  - Re-circulating water
  - Heated cables
Nest boxes

- Size depends upon size of rabbit, e.g. 16 x 10 x 8 in.
- Made from wood, metal, plastic, or wire.
- Purchased or homemade
- With or without lid.
- Inside or outside cage.
- On cage floor or below.
- Bed with hay or straw.
- Insulate in winter.
Manure

**Production** 10-lb. doe
- 0.31 lbs/day (feces + urine)
- 0.056 ton per year

**Composition**
- 2.4 - 1.4 - 0.6 (N-P-K)
- 51.6% total solids
  - 24.5 lb. N/ton
  - 25.2 lb. P/ton
  - 11.1 lb. K/ton

Rabbit manure makes excellent fertilizer.
Manure handling

Collection
1. Manually remove manure from under cages
2. Collect manure on trays underneath cages and remove manually.
3. Install an automatic manure removal system (flush).

Disposal
1. Use as organic fertilizer
2. Compost and sell as organic fertilizer
3. Grow worms
4. Make methane (energy)
Basics of reproduction

- Puberty (sexual maturity) varies by breed
  - 4-5 months (small)
  - 5-6 months (medium)
  - 9-12 months (large)
  - Does mature sooner than bucks
  - Does get bigger (heavier) than bucks

- No estrus cycle
  Induced (spontaneous) ovulators

- ~30 day gestation period

- 1-14 young per litter (avg. 8)

- 4-8 litters per year
  - Can rebreed as early as 14 days after kindling
  - Wild rabbits breed within days of kindling
Reproductive Management

- Should take doe to buck’s cage for breeding.
- Can palpate to determine pregnancy at 14 days.
- Put nest box in 28 days after breeding.
  - Doe will line nest with fur.
- Inspect litter after kindling
  - Can cross-foster litters (1-3 days of age)
- Wean at 4 to 8 weeks (or later).
Kits (bunnies)

- Born blind, furless, and helpless
  - Fur begins to grow at about 4 days of age
  - Eyes open about 10 days after birth.

- Does usually only nurse kits once per day.

- Take nest box out when kits are 15-21 days old.

- Can wean as early as 28 days for commercial production.
  - More efficient to feed kits than doe
  - Decline in milk production
  - Kits are eating solid feed
  - Lactation is stressful to doe.

💰 Wean later (e.g. 8 weeks) for pets, show, and hobby.
Environmental considerations

Ideal environment for a rabbit is 50-60°F.

- Rabbits are very susceptible to heat stress.
- High temperatures and humidity can lower reproduction.
- Winter decline in fertility may be due to decreasing day length.
  - Can use lights to maintain 14-16 hrs. of light.
Rabbit Digestive System

- Herbivore with a simple stomach

- Hind-gut fermenter
  - Microbial digestion occurs in the large intestine and cecum.
  - Sensitive to diet changes (specially overload of carbs)

- Coprophagy – rabbits re-ingest their soft night time feces.
Feeding

- Biggest expense
  - >75 percent (up to > 90%)

- Rabbits are efficient converters of feed
  - 1 lb. of meat from 4 lbs. of feed

- Feed by weight (ounces) not volume (cups).
  - Amount depends on size of rabbit and stage of production.

- Control feed wastage!
Traditional diets

- **Commercial rabbit feed**
  - 100% balanced
  - 16-18% CP
  - Pellet
  - Dehydrated alfalfa meal is usually the main ingredient.
  - 25 and 50-lb. bags
  - Expensive!
    - $15-$20/50 lb. bag

- All feeds are not created equal!
  - Ingredients
  - Pellet quality
  - Cost of gain
Alternative feeds
Can reduce feed costs, but be careful!

- Hay
- Fresh greens
- Crop residues
- Agricultural by-products
- Pasture

- May reduce performance.
- High moisture feeds can cause diarrhea.
- Wilted or spoiled feed may cause digestive upsets.
- Always introduce new feeds slowly.
Rabbit health

- No vaccinations or deworming.
- Require excellent sanitation and healthy diet.
- Biosecurity very important.
- Veterinary expertise and approved drugs lacking.
Common diseases

**Ear canker (ear mites)**
- Can cause inner ear infection, “wry neck”
- Treatment
  - Ear mite drops
  - Mineral oil
  - Ivermectin (Rx)

**Sore hocks**
- Treat with antiseptics and antibiotics.
- Prevention
  - Good hygiene
  - Provide board or mat for rabbit to rest on.
  - Favor rabbits with thick feet pads.
Respiratory Disease

Snuffles

- Upper respiratory disease
- Treat with antibiotics
- Prevention
  - Good sanitation
  - Good management
  - Biosecurity
  - Antibiotics in feed
Common diarrheal diseases

**Coccidiosis** *(Eimeria spp.)*
- Intestinal and hepatic (liver)
- Treat with antibiotics (Rx)
- Prevent with good hygiene and anti-coccidial medications.

**Enteritis** (complex)
- Inflammation of the intestinal tract
- Various causes: *e. coli*, *clostridium perfringins*, and *salmonella*.
- Diarrhea is common symptom.
- Treat with antibiotics and supportive care.
- Prevent with good hygiene, gradual changes in diet, and adequate fiber in diet.

*Image from rabbitsandguineapigs.blogspot.com*
Rabbit slaughter

- USDA does not recognize rabbits as an agricultural animal.

- Rabbits are a non-amendable species:
  
  **Congress has not mandated inspection of rabbits under either the Federal Meat Inspection Act (FMIA) or the Poultry Processing Inspection Act (PPIA); therefore, inspection of rabbit is voluntary (and costly).**

- However, some states, permit the sale of rabbit only if it is inspected under their laws.
Rabbit slaughter in Maryland

- The Maryland Department of Health and Mental Hygiene (DHMH) does not consider rabbits slaughtered under federal exemption to be an approved source of meat (for resale) in Maryland.

- However, producers can participate in Maryland’s new voluntary program and receive certification as an approved source by DHMH and sell rabbit meat (whole carcass or parts) anywhere intrastate.
Suggested resources

- American Rabbit Breeders Association
  www.arba.net

- Rabbit links on the Maryland Small Ruminant Page
  http://www.sheepandgoat.com/rabbits.html

- Rabbit Production: “tastes like chicken” (today’s presentation)
  http://www.slideshare.net/schoenian/rabbit-production

- Rabbit Production by Cheeke, Patton, Lukefahr, and McNitt

- Maryland Poultry On-farm slaughter/processing Program
  http://www.mda.state.md.us/feed-food_safety-grading/food_qual_assur/poultry_rabbit/index.php

- National 4-H Rabbit Curriculum
  http://www.4-h.org/resource-library/curriculum/4-h-rabbit/
Questions?

Thank you for your attention.

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