CAPTIVE REARING OF EASTERN COTTONTAIL RABBITS

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BABY RABBITS...

- Have no scent
- Cannot be moved
- Are rarely orphaned due to nest disturbance
- Are easily found in urban/populated areas
- Are abundant in residential habitats
  - Commonly in ‘dog yards’
- Seem poorly guarded during the day
- Are likely the most commonly kidnapped North American mammal species
WORKING WITH THE PUBLIC

The only rabbits that should be accepted are those...
- Caught by a cat
- With visible injuries
- Attracting flies
- With a dead adult within 15ft of the nest
- With confirmed absence of the mother for one entire night
DEVELOPMENTAL CONSIDERATIONS

• Birth weight 26-34g*

• Eyes open
  – 9.5 days in the wild
  – 7 days in captivity

• 14 days
  – Fully furred
  – Eliminating on own

• 21 days
  – Reliably self feeding
  – Eyes bright and alert
  – Reportedly “weaned”

• 26 days
  – Actual age rabbits are observed dispersing from unmolested nest sites
DEVELOPMENTAL CONCERNS

Rabbits...

Have no functional pancreas until after they disperse from the nest.

– Pancreatic enzymes are necessary to break down sugars and starches.

– Feed ONLY formula, greens, and rabbit pellets.

– Fruits and vegetables CAN NOT be broken down or digested.
It's not worth it, Roy! Let's just give him our noses & let him go!
DEVELOPMENTAL CONCERNS

Rabbits...

- Are born with a benign gut with a neutral pH
- This environment is vulnerable to almost any pathogen
  - Clean cage floor at all times
  - Fresh (uncontaminated) greens
  - CLEAN FEEDING EQUIPMENT
  - Pay extra attention to cleanliness when working with baby rabbits!
DEVELOPMENTAL CONCERNS

Rabbits...

– Are hind gut fermenters and have a caecum.

– The caecum contains unique flora (yeast, enzymes, and bacteria) that helps digest their high fiber diet.

– Unbalanced digestive flora affects digestive efficiency and therefore reduces the actual caloric intake.
DEVELOPMENTAL CONCERNS

Rabbits...

– Have bladders that can easily hold very large volumes of urine compared to other mammals.

– This is the reason that they MUST be stimulated to be accurately weighed!

– Adults and sub-adults rely on caecotropes for optimal nutrition.
COMMON (WIDELY ACCEPTED) MYTHS...

• “Rabbits are easily stressed and have an accepted high mortality rate when reared in captivity.”

• “They usually die, so prepare yourself before you even try.”

• “Handle them as little as possible!”

• “They usually get diarrhea before they die.”

• “They do not take formula well, do the best you can, it’s all you can do.”
MY THEORY...

Stress is rarely the cause of mortality in captive E. C. rabbits.

Actual Caloric Intake is the limiting factor of successfully ‘growing’ healthy Eastern Cottontail Rabbits.

We admitted 1310 Eastern Cottontail Rabbits in 2011 and 1292 in 2012.

84% (-DPE) were reared successfully and released using the following methods...
INTAKE

- Stimulate elimination in newly admitted rabbits of any age

- Record accurate body weight (preferably in grams)

Once warm and stable...
- Hydrate aggressively
  - Oral Fluids
    - Pedialyte™ or equivalent (5-10% bw)
  - Injectable Fluids
    - Administer a bolus of warm SQ fluids
      » 5-10% bw depending on the estimated degree of dehydration
      » 2.5% Dextrose in 0.45% Sodium Chloride is ideal for general rehydration and will also stabilize and help regulate blood sugar
      » A short 25-23 gauge needle is recommended

- Evaluate and do a quick gross exam on each animal
- Re-assess heat needs and set up cage
PHYSICAL EXAM CONSIDERATIONS

- Body Temperature
- Overall attitude
- General body condition
- Eyes
  - Clarity, blood, nystagmus
- Mouth
  - Teeth Alignment
  - Color of mucous membranes
    - Pink and moist is best
- Fullness of belly
  - milk line vs. bloat
- Fullness of bladder
- Any sign of diarrhea
- External parasites
- Wounds
  - Often found by feeling dried blood
IDENTIFICATION MARKS

We have tried many methods.....
IDENTIFICATION MARKS

We have had the best results using the following:

• For low numbers- **permanent marker** dot on inside of ear.

• For higher numbers- pet quality (non-toxic, quick dry) **nail polish**.

• Each group is assigned a color and a whole foot is polished.

• i.e. If there are 5 litter or cage mates, they may be marked as:
  
  – RIGHT FRONT ORANGE (RF)
  – LEFT FRONT (LF)
  – RIGHT REAR (RR)
  – LEFT REAR (LR)
  – RIGHT EAR (RE)
FEEDING CONSIDERATIONS

• The first 1-2 feedings should be pedialyte followed by undiluted formula.

• After the first day, body weight should increase daily. Any rabbit not consistently gaining should be considered critical!

• If hand feeding, estimate and account for any formula not ingested.

• **Always feed no less than 10% bw in grams.**
  – i.e. Remove the last digit from the number of grams
  • 100g = 100 = ≥10cc
  • 86g = ≥8cc
  • 42g = ≥4cc
FEEDING CONSIDERATIONS

• Regardless of the rabbit's age, start with BID feedings.

• If weight gain is not consistent, can add a third feeding until good weight curve or reliably self feeding.

• Feeding frequency should be based on weight gain regardless of age.
**Eastern Cottontail Rabbit**

### Feeding Plan

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<th>Weight</th>
<th>Time</th>
<th>Amount</th>
<th>Stim (u/f)</th>
<th>Notes</th>
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# Eastern Cottontail Rabbit

**Feeding Plan:** BID

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**Meds:** Yes, see chart

**ID. MARK:** Rear green

**Case #:** 164

**Cage / Location:** AQ 18

**Initials:**
FEEDING CONSIDERATIONS

• All formula and feeding utensils should be handled and kept as aseptically as possible…..

• The temperature of the formula must be monitored closely
  – 100°-102°F (~38°C) is optimal
  – Temperature is critical **as ingested**!
  – Common issue in rehabilitation

• Probiotic Considerations
  – *We have had the best results* with full fat greek yogurt at every feeding regardless of age
Silicone Nipples are Ideal For Hand Feeding Rabbits
FORMULA CONSIDERATIONS

Fox Valley™ 32/40

OR

1 part KMR™ : 1 part Ultra-Boost™ : 2 parts Water
RABBIT HOUSING

Eyes CLOSED

Eyes OPEN
NEWBORNS AND INFANTS (0-10 DAYS)

• Feed 2* times daily.

• Space 6-8 hours between feedings.

• ALWAYS feed until total amount consumed is no less than 10% bw in grams.

• Stimulate at every feeding.
10-14 Days

Development
- Fully furred
- Eyes and ears open
- Should still be stimulated at every feeding

Feeding
- Offer solid food (fresh greens) as soon as eyes open on the eldest rabbit in the group
- Continue to feed formula BID until rabbit begins to nibble
- Keep fresh greens available at all times and offer rabbit pellets
10-14 D A Y S

Additional Considerations

• Cover nest (in heated area of cage) with a small ‘hidey box’

• Monitor hydration status, injectable fluids may be helpful

• Keep cage clean and dry
  – they tend to randomly nibble on the ground
  – Very susceptible to E. coli and Clostridium sp
14-21 DAYS

Development
• Fur is filling out and eyes are bright
• Mobile / exploring space
• Daily weight gain increasing significantly
• Drinking
• Responsive to visual and tactile stimuli
• Learning / absorbing sensory and environmental information

Feeding
When wt is increasing consistently and nibbling behavior is observed / evident, ↓feeding to SID, with meals no more than 8 hours apart.

Closely monitor weight, if no gain in 24 hours, feed BID for 2 more days before trying again.
14 - 21 Days (Weaning)

- This age has a relatively high mortality rate
- Cage MUST be clean and dry
- Fresh greens* should be available at all times
- Ideally, a pile of greens that is 3X the body size of the group should be offered again at night
- Move outdoors as early as possible, even if supplemental heat is still necessary
- Weight curve should be watched closely and is the best indicator of true health status
Food items should be chosen to maximize fiber and minimize carbohydrates and sugars.

**ACCEPTABLE FORAGE FOODS**
- Clover
- Dandelion
- Fresh and dried field grasses
- Timothy hay

**ADDITIONAL FOOD ITEMS**
- Rabbit pellets
- Dark green leafy vegetables
  - Kale, green/red leaf and romaine lettuce, carrot tops
  - Parsley and cilantro (in small amounts to avoid soft stool)
  - Rose petals

**UNACCEPTABLE FOODS...**
- Iceberg lettuce
- Any kind of fruit
- Any kind of root vegetables
  - Carrots, radishes, yams, beets, etc
- Nuts
- Grains (including corn)
- Seeds or seed mixes
WEANING RABBITS OFF FORMULA

• Contrary to most other species, rabbits should never be aggressively weaned.

• Because caloric intake is so critical to their early survival, diet should be supplemented with formula until consistent weight gain is confirmed.

• Body weights should not be used to determine age or weaning plan, only use changes in weight.

• If body weight does not increase DAILY, do not decrease formula!

Remember… no change in weight is considered a loss and formula should be given TID!!!
Additional Considerations Based on Trends Observed

• Minimum release weight 140g*.

• Rabbits over 165g* must be housed alone!

• Those with abdominal wounds rarely survive (especially those <21 days of age).

• Compromised rabbits commonly have low levels of blood sugar, can stabilize with digestible forms of glucose.
  – i.e. 50% Dextrose PO

• Degloved tissue tends to heal very well.
ADDITIONAL CONSIDERATIONS
CURRENTLY UNDER REVIEW

- Diarrhea!!!
  - Diet (Formula) vs. Husbandry (Bacteria)
- Mineral Needs
- Water Quality
- Use of Caecotropes
- Antimicrobial Use
- Exercise Requirements
In Summary...

• Feed as much as you can! No meal should be less than 10% bw.

• Focus on the calories, not the stress factors.

• Get them outside as early as possible once self feeding.

• Always monitor body weight, it has proven to be the most reliable indicator in this species.

• A high mortality rate should NEVER be accepted as a standard, just a reason to try harder and learn more.

• Don’t give up on them because they are rabbits, without them, the entire food chain suffers.

• We are their last resort, they deserve the best we can provide!!!
Thank You!