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HUSBANDRY SYSTEM FOR HAND REARING FAWNS IN INDOOR PENS

by

Wayne S. Budde

INTRODUCTION

During the spring of 1979, 16 female white-tailed deer (Odocoileus virginianus) fawns were raised in an indoor environmental chamber with minimal space (91.8 m²) per animal. Several authors have published husbandry techniques for rearing fawns in outdoor pens, experimenting with various milk substitutes and handling techniques (Buckland et al. 1975, Trainer 1962, Silver 1961, Murphy 1960). The purpose of this paper is to present information on raising a large number of healthy fawns with minimal personnel time required. Tables and illustrations are given to present a complete chronological methodology for rearing fawns from birth until weaning.

MATERIALS AND METHODS

A rearing chamber was constructed in the basement of a barn at the Rose Lake Wildlife Research Center, East Lansing, Michigan 48823. The chamber was 18.6 x 9.4 m with cement flooring, sheet metal and fieldstone walls, and structural timber ceilings. Straw was used as the bedding material with new straw layered over the base every day. Ventilation fans and outside vents maintained fresh air and ambient temperatures within. Four, 4-bulb fluorescent fixtures, each 1.8 m in length, provided 5-ft candle illumination.

Photoperiod was regulated at 16 hours of light and 8 hours of darkness during the rearing process. Fawns, ages 1 to 14 days, were obtained from Michigan's Lower Peninsula during May and June. Prophylactic medication, administered the first day they were obtained (Table 1) was given to each fawn by intramuscular injections. An intramuscular injection of selenium and vitamin E (BO-SE) was given as a precaution against white muscle disease which has been reported in Michigan (Brady et al. 1978). An anthelmintic paste was administered orally once weekly for 5 weeks for gastro-intestinal parasite prevention. In addition, the navel of fawns 1 to 3 days of age, was medicated with an iodine solution (Betadine, The Purdue Frederick Co., Norwalk, CT 06856) to prevent infection. Scours were treated with 5cc Kaopectate (Upjohn Co., Kalamazoo, MI 49003) added to the fawn's milk for 1 to 2 days. Fecal sugar flotation examinations (Georgi 1974) were made monthly to monitor possible parasite infections.

Milk consumption, by days of age, is presented in Table 2. Cow colostrum was fed to fawns 1 to 7 days old to provide intestinal immunological protection and to ease the transition from doe milk to milk replacer. A medicated (neomycin base) lamb milk replacer was selected due to the similarity of its composition to doe's milk (Table 3), low cost (Table 4), and ease in mixing and storing. Lamb pop-bottle nipples (Rhinehart Inc., Spencerville, IN 47808) and beverage bottles were used for feeding. All feeding utensils were rinsed in hot water prior to use and filled with milk warmed to 37°C.

The nursing to weaning procedure developed through 3 stages. First, the fawn was acclimated to its surrogate mother and artificial nipple. The attendants stood in a crouched position with the fawn held between his legs and the head forward, using one hand to tilt the head and open the mouth while the other hand manipulated the bottle. To encourage a hesitant fawn to nurse, the nipple was rotated in its mouth, permitting small quantities of milk to enter while simultaneously massaging the throat to facilitate swallowing. Perianal stimulation with a warm, damp cloth while nursing often encouraged suckling.

After 1 week, a voluntary feeding station was established. The feeding station consisted of straw bales used as benches and recording table. During this phase, attendants would wait for fawns to voluntarily approach and nurse. For the first 3 days, fawns not voluntarily feeding were forceably brought to the feeding station and fed. After the 3 day initiation period, fawns still hesitant to feed voluntarily were allowed to go without milk. Within 3 days the involuntary feeders approached and nursed from the feeding station. Two weeks were necessary for completion of this phase.

The third and final phase consisted of constructing a suspended nursing rack (Figure 1) in the same area as the established feeding station. Familiarity with being fed from hand-held nursing bottles in that location of the rearing chamber eased the transition to rack-held bottles. The simulated doe/fawn nursing posture and lack of human intervention may have contributed to the feeding rack's success. Consumption was ad libitum with those fawns requiring more than the contents of one bottle moving to an unfinished bottle.

Water and supplementary solid food items (Table 5) were made available from the start of the rearing process. Exotic ruminant pellets (The Andersons, Maumee, OH 43609), formulated for white-tailed deer and other exotic ruminants (Ullrey 1980), were made available at 2 weeks of age. Shelled corn was mixed with the pellets for the first 2 weeks to encourage their use.

Weaning was accomplished by gradually reducing the amount of milk in each container and the number of bottles placed on the rack. Concurrently, more solid food was offered prior to bottle feeding. The weaning process required 2 weeks and was completed when the fawns were approximately 3 months old.

Sand was frequently consumed by the fawns during the first 2 weeks of age. The consumption of sand by fawns up to 1 month old has been noted by William Youatt, Michigan Department of Natural Resources Wildlife Division (personal communication). Freshly cut grass (Bromus sp.) was available with some consumption beginning at 2 weeks of age.

Natural woody browse (stems, petioles, leaves) was supplied as it became seasonally available. Plant species high in abundance and preference such as trembling aspen (Populus tremuloides), large toothed aspen (Populus grandidentata) and red osier dogwood (Cornus stolonifera) were used. Fresh browse was supplied until the first leaf drop (30 October). Second and third cut alfalfa hay was offered but was consumed only after all fresh vegetation was eaten.

Fawn body weights were recorded at 1 week intervals, until 3 months of age.

RESULTS AND DISCUSSION

Table 6 lists average daily weight gains and body weights by month from birth until 3 months of age.

Fecal examinations indicated no occurrence of internal parasites in any of the fawns.

After weaning, approximately 3.79 liters of water was consumed daily per animal.

Fawns from this study had an average daily weight gain of 0.15 kg and an average body weight of 20.3 kg at 3.5 months of age, similar to growth rates recorded for outdoor rearing. Buckland et al. (1975) reported an average body weight of 20.5 kg for 3.5-month-old whitetail fawns that were raised on raw Holstein milk. Long et al. (1961) reported a daily growth rate for fawns raised on raw milk of 0.16 kg and 0.10 kg for milk replacer.

Scouring or constipation, a common problem in hand rearing fawns, can affect weight gain and vigor and require many hours for treatment. Long et al. (1961) indicated 3 of 13 fawns died of a coliform infection (scours) during a rearing study. Trainer (1962) found scours occurred occasionally in hand raised fawns 4 weeks of age or less, raised on whole milk. Buckland et al. (1975) attributed their rearing success to "constant attention to digestive tract disorders." A few cases of scours were encountered during this study, but were treated with Kaopectate during normal feeding practices. The use of a medicated milk substitute, along with other rearing practices mentioned, may have contributed to the low occurrence of digestive tract disorders.

The planned progression of nursing techniques, leading to a hands-off nursing rack, eliminated many handling hours. Perianal stimulation of fawns twice daily until approximately 1 month of age, has been suggested (Buckland et al. 1975) to stimulate defecation and urination. However, in this study, the practice was necessary only until 1 week of age, at which time mutual grooming by fawns accomplished the task.

In other fawn rearing studies considerable attention has been focused on disinfection techniques for feeding equipment, medicated foot baths for personnel, heat lamps, and individual pens for sick animals and removal of all fecal matter daily. These are sound husbandry techniques, but can be costly and time consuming. In this study, preventative medication, hot water cleaning of feeding equipment, daily addition of new bedding material, and a suitable milk substitute succeeded in producing viable and healthy fawns with minimal time invested.

In a final note, the observation of Buckland et al. (1975) that the first few weeks after birth are crucial to the fawns survival, can't be overemphasized. The use of cow colostrum for the first few days, and attention to stimulating elimination of the meconium, the first fecal excretion, is very important. The use of a stomach tube to force feed weak and/or hesitant fawns may be necessary for the first week, and shouldn't be overlooked. In cases of prolonged scouring, it has been suggested (Stephen Schmitt, DVM, Rose Lake Pathology Laboratory, personal communication) that the milk substitute be withheld for a few days and replaced by an electrolyte solution to prevent dehydration and eliminate the supporting media for the pathogenic intestinal bacteria. The use of an individual

fawn record keeping system, to chart daily food consumption and medical treatment and changes in behavior, may be the key to diagnosing and treating an illness before serious complications arise.

LITERATURE CITED

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Table 1. Prophylactic medication schedule for fawns.

Dose	Product	Constituents	Manufacturer
$\frac{1}{4}$ cc ¹	BO-SE [®]	1 mg selenium/ml 50 mg vitamin E/ml	Burns-Biotec Laboratory Chromalloy Pharmaceutical Division Oakland, CA 94621
$\frac{1}{4}$ cc ¹	INJACOM [®]	500,000 IU vitamin A/ml 75,000 IU vitamin D ₃ /ml	Roche Chemical Division Hoffman-LaRoche Inc. Nutley, NJ 07110
1cc ¹	FLOCELLIN [®]	150,000 IU penicillin g benzathine/ml 150,000 IU penicillin g procaine/ml	Veterinary Products Bristol Laboratories Syracuse, NY 13201
2.54 cm	TELMIN PASTE [®]	200 mg mebendazole/g	Pitman-Moore Washington Crossing NJ 08560

¹Injections given intramuscularly.

Table 2. Fawn feeding schedule.

Days after birth	Frequency	Amount fed per feeding (ml)	Formula
1-2	3 hr intervals	30-60	cow colostrum
3-4	4 hr intervals	90	cow colostrum
5	4 times daily	120-240	$\frac{1}{2}$ cow colostrum $\frac{1}{2}$ milk replacer ^a
6	4 times daily	120-240	$\frac{1}{4}$ cow colostrum $\frac{3}{4}$ milk replacer
7	4 times daily	120-240	milk replacer
8-20	2 times daily	300-350	milk replacer
21-34	2 times daily	350-450	milk replacer
35-70	2 times daily	450-600	milk replacer

^aLand O'Lakes, Minneapolis, MN 54403 lamb milk replacer.

Table 3. Composition (% fresh basis) of white-tailed deer does milk and lamb milk replacer.

Item	Water (%)	Protein (%)	Fat (%)	Sugar (%)	Ash (%)	
Milk replacer ^a	80.0	4.8	6.0	7.0	1.4	(Sheep production guide - Land O' Lakes, Inc., Agricultural Services, Fort Dodge, IA 50501)
Does milk ^b	77.8	10.1	7.5	3.0	1.6	(Silver 1961)

^aAfter dilution of 1 part dry matter with 4 parts water.

^bAt 1 month lactation.

Table 4. Milk replacer costs for raising a white-tailed deer fawn.

Lamb milk replacer	
Total consumption of liquid 0-90 days	approx. 77ℓ ^a
Cost/unit	\$21.95/11.34kg ^b (25 lb.)
Dilution ratio	1 part dry replacer + 4 parts water
Cost/ℓ	\$0.218 ^c
Total cost/fawn	\$16.80

^aAverage for 16 fawns.

^b1979 price.

^c560g/ℓ of dry milk replacer.

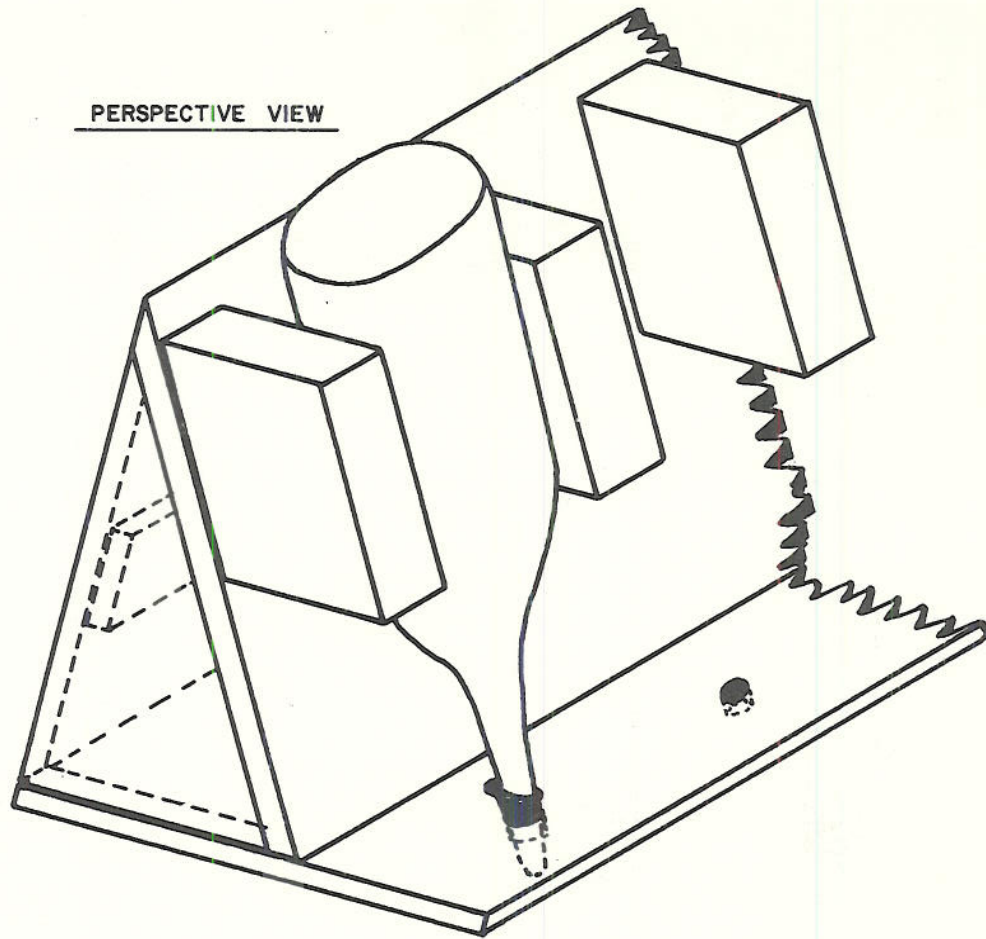
Table 5. Supplementary solid feed schedule for nursing white-tailed deer fawns.

Solid feed supplement	Days of age when first consumed	Amount offered
Sand	7-14	free choice
Grass	21	free choice
Hay	21	free choice
Woody browse	21	free choice
Corn	21	170g/day/fawn
Pellets	21	free choice

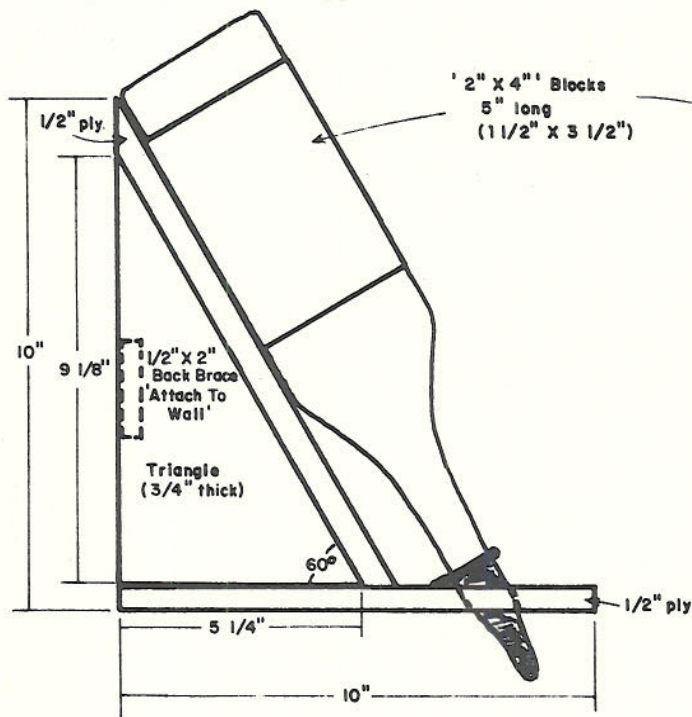
Table 6. Average growth rates (0-100 days of age) for 16 hand reared white-tailed deer fawns in indoor pens.

Month	Daily average weight gains (kg)	Average body weights (kg)
June	0.145	8.99
July	0.195	11.59
August	0.140	18.41
September	0.133	20.25

PERSPECTIVE VIEW



SIDE VIEW



FRONT VIEW

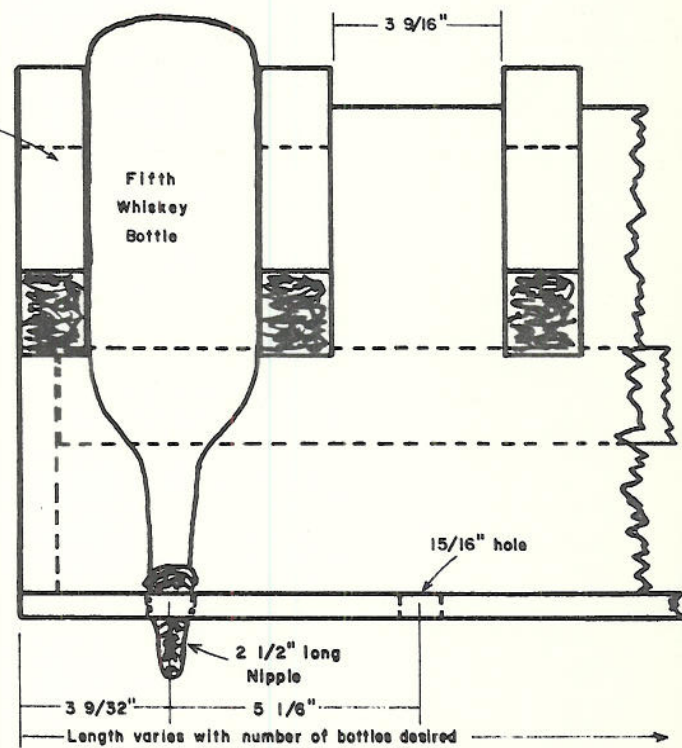


Figure 1 - NURSING BOTTLE

