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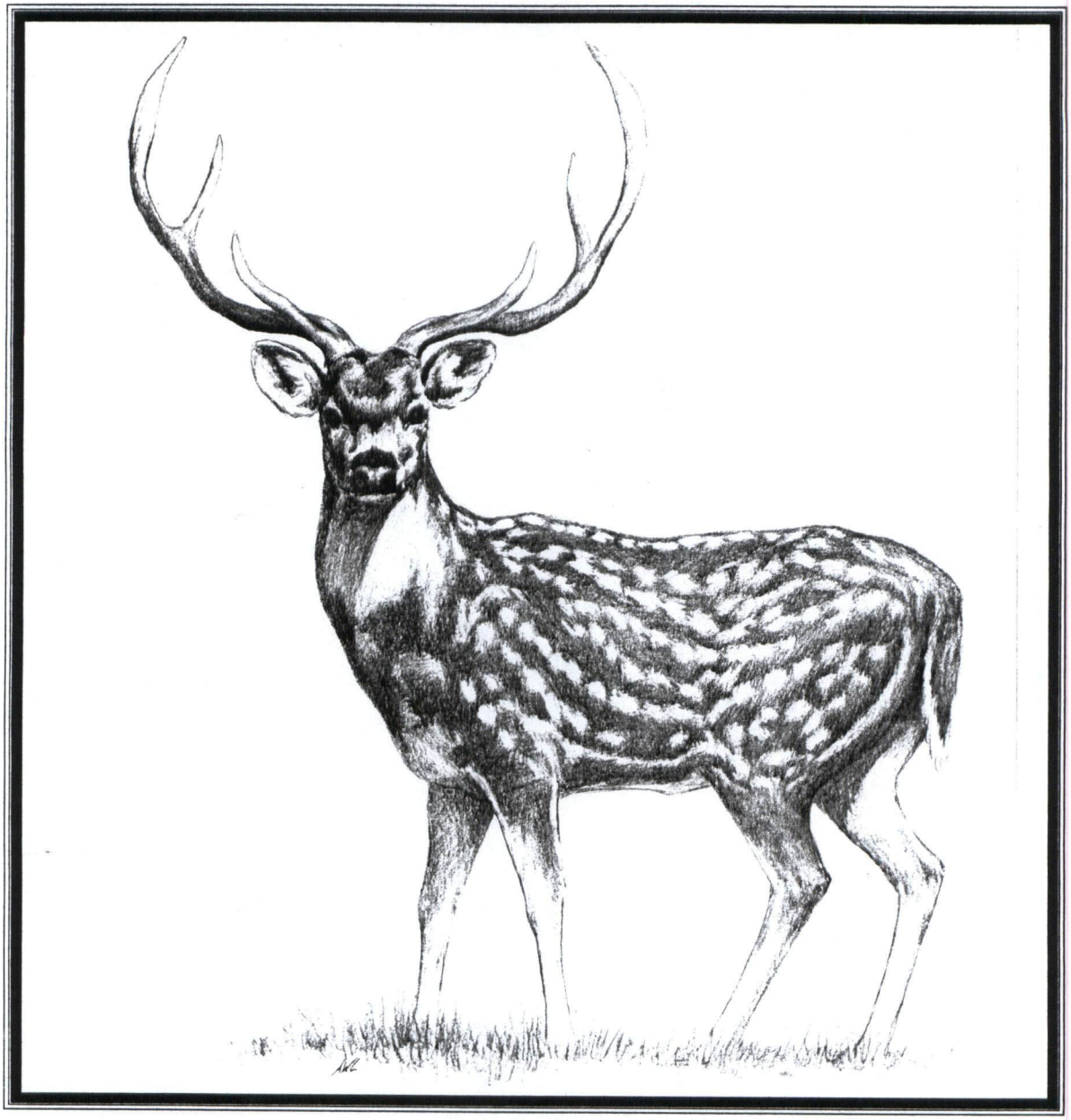
# *Non-Native Deer Farming Symposium*



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# CHAPTER 9

# GROWTH AND CARCASS CHARACTERISTICS OF FARMED NON-NATIVE DEER

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## INTRODUCTION

Various species of deer are being farmed for venison production under variable management conditions. Information relating productivity of the differing species under differing management systems and carcass characteristics is important for deer farmers. A series of experiments have been carried out at the Texas A&M University Agricultural Research and Extension Center at Overton with the following results and applications.

## BODY WEIGHT GAINS OF WEANED 1/4 MESOPOTAMIAN FALLOW, EUROPEAN FALLOW AND AXIS BUCKS IN DRYLOT, ON RYE-RYEGRASS PASTURE OR ON COASTAL BERMUDAGRASS PASTURE

**Background.** Mesopotamian Fallow crossbred with European Fallow, European Fallow and Axis deer are being used for venison production. Mesopotamian Fallow are larger than European Fallow or Axis deer. Various management systems are used for different times of the year and as forage quality and quantity vary. The objective of this study was to compare body weight gains of 1/4 Mesopotamian Fallow, European Fallow and Axis bucks in the feedlot, grazing rye-ryegrass pasture or grazing Coastal bermudagrass pasture.

Twenty eight 1/4 Mesopotamian Fallow bucks were transported from Yancey, Texas after weaning in October, 1995. Twelve European Fallow and 6 Axis bucks produced at the Texas Agricultural Experiment Station at Overton were weaned in October, 1995 and commingled with the 1/4 Mesopotamian Fallow bucks. From October 29, 1995 through January 12, 1996 (78 days), the bucks were kept in a drylot and fed 3% of their body weight of 2:1 alfalfa pellets:ground corn and free choice Coastal bermudagrass hay, salt, minerals and water (Feedlot). From January 24, 1996 through April 3, 1996 (70 days), the bucks grazed rye-ryegrass pastures with free choice access to water, salt and minerals (Winter Pasture). From June 11, 1996 through August 6, 1996, the bucks grazed Coastal bermudagrass pastures with free choice access to water, salt and minerals (Summer Pasture). The animals were weighed at 28 day intervals throughout the October, 1995

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through August, 1996 period. Body weight and average daily gains were recorded for each animal type for the Feedlot, Winter Pasture and Summer Pasture periods.

**Research Findings.** Average daily gains were greater ($P<0.0001$) in the Feedlot for 1/4 Mesopotamian Fallow compared with European Fallow or Axis bucks which had similar ($P>0.1$) average daily gains (Table 1). When grazing winter pasture a similar pattern was found with greater ($P<0.004$) average daily gains for 1/4 Mesopotamian Fallow compared with European Fallow or Axis bucks which had similar ($P>0.1$) average daily gains (Table 1). During the summer pasture period greater ($P<0.02$) average daily gains were found in the Axis than in 1/4 Mesopotamian Fallow bucks with the European Fallow being intermediate and not different from any other type (Table 1).

**Application.** When higher quality and quantities of nutrients were utilized (Feedlot or Winter Pasture) the 1/4 Mesopotamian Fallow bucks were superior to either European Fallow or Axis bucks. When lower quality forage was utilized the Axis bucks were superior to 1/4 Mesopotamian Fallow but not the European Fallow bucks. The animals with the greatest potential for weight gains (1/4 Mesopotamian Fallow bucks) performed the best in the feedlot and on high quality cool season forages. The Axis bucks had the lowest ability to gain weight on high quality feedstuffs but had the highest performance on low quality forage.

Table 1. Comparison of average daily weight gains (mean $\pm$ standard error) of yearling 1/4 Mesopotamian Fallow, European Fallow and Axis Bucks in feedlot and grazing either winter (rye-ryegrass) or summer (Coastal bermudagrass) pastures.

| Management System | SPECIES | | | Probability |
|---|---|---|---|---|
| | 1/4 Mesopotamian Fallow | European Fallow | Axis | |
| Feedlot | $0.216 \pm 0.008^{a}$ | $0.146 \pm 0.013^{b}$ | $0.117 \pm 0.018^{b}$ | $P<0.0001$ |
| Winter Pasture | $0.252 \pm 0.010^{a}$ | $0.208 \pm 0.012^{b}$ | $0.195 \pm 0.016^{b}$ | $P<0.004$ |
| Summer Pasture | $0.024 \pm 0.012^{a}$ | $0.060 \pm 0.018^{ab}$ | $0.104 \pm 0.025^{b}$ | $P<0.02$ |

[ab]Means in rows with different superscripts differ $P<0.05$.

## COMPARISON OF GROWTH AND CARCASS CHARACTERISTICS OF YEARLING EUROPEAN FALLOW WITH AXIS BUCKS

**Background.** Different species of deer are being used for venison production. Two important species used are the Fallow and Axis. The objective of this experiment was to evaluate growth from weaning to slaughter and carcass traits in European Fallow and Axis yearling bucks.

Six European Fallow and 6 Axis bucks produced at the Texas Agricultural Experiment Station at Overton were weaned in October, 1995 and commingled for this experiment. Prior to availability of rye-ryegrass pastures, the bucks were kept in drylot and received 3% of their body weight of 2:1 alfalfa pellets:ground corn and free choice Coastal bermudagrass hay, salt, minerals and water. The bucks grazed rye-ryegrass pastures from January through April and Coastal bermudagrass pastures from April through August with free choice access to water, salt and minerals. The bucks were weighed at 28 days intervals throughout the 305 day experimental period. Carcass data collected included hot carcass weight, dressing percent, carcass and leg conformation scores, leg weight (bone in), tenderloin weight and boneless sirloin weight.

**Research Findings.** Body weight gains were similar in both species (Table 1) but live weight at slaughter tended ($P<0.08$) to be greater in Axis compared with European Fallow bucks (Table 2). Hot carcass weights were greater ($P<0.001$) for the Axis than the European Fallow bucks and dressing percent was also greater ($P<0.0001$) for the Axis bucks (Table 2).

Carcass and leg conformation scores (1-12) were better ($P<0.02$) in Axis compared with European Fallow bucks (Table 2). Weight of the leg (bone in) was greater ($P<0.0001$; Table 2) and made up a greater ($P<0.03$) proportion of hot carcass weight (Table 3) in Axis compared with European Fallow bucks. Weight of the tenderloin (Table 2) tended ($P<0.06$) to be greater and tended ($P<0.09$) to make up a greater proportion of hot carcass weight (Table 3) in Axis compared with European Fallow bucks. Weight of the boneless sirloin (Table 2) was greater ($P<0.002$) and made up a greater ($P<0.05$) proportion of hot carcass weight (Table 3) in Axis compared with European Fallow bucks.

**Application.** Growth traits were similar in Axis and European Fallow bucks from weaning to slaughter as yearlings. Carcass characteristics such as hot carcass weight, dressing percent, carcass and leg conformation, and proportions of the carcass in the leg, tenderloin and sirloin were superior in Axis compared with European Fallow bucks. However, temperament favored the European Fallow bucks over the Axis in their acceptance of handling and management.

Table 1. Body weight gains (mean $\pm$ standard error) from weaning through slaughter in yearling European Fallow bucks compared to Axis bucks.

| Parameter | Species | | |
|---|---|---|---|
| | Fallow | Axis | Probability |
| 305 day weight gain (lb) | 48.0 $\pm$ 1.6 | 48.7 $\pm$ 1.6 | $P > 0.1$ |
| Average daily gain (lb) | 0.157 $\pm$ 0.005 | 0.160 $\pm$ 0.005 | $P > 0.1$ |

Table 2. Comparison of carcass characteristics (mean ± standard error) of yearling Fallow bucks compared to Axis bucks.

| Parameter | Species | | |
|---|---|---|---|
| | Fallow | Axis | Probability |
| Liveweight (lb) | 107.7 ± 2.7 | 115.3 ± 2.7 | P < 0.08 |
| Hot carcass weight (lb) | 58.0 ± 1.5 | 68.0 ± 1.5 | P < 0.001 |
| Dressing percent (%) | 53.9 ± 0.4 | 59.0 ± 0.4 | P < 0.0001 |
| Carcass conformation score (1-12)[a] | 3.2 ± 0.3 | 4.5 ± 0.3 | P < 0.02 |
| Leg conformation score (1-12) | 3.2 ± 0.6 | 5.6 ± 0.6 | P < 0.02 |
| Leg weight - bone in (lb) | 17.6 ± 0.5 | 21.5 ± 0.5 | P < 0.0001 |
| Tenderloin (lb) | 0.9 ± 0.1 | 1.4 ± 0.2 | P < 0.06 |
| Sirloin - boneless (lb) | 6.3 ± 0.2 | 7.4 ± 0.2 | P < 0.002 |

[a]1 = poorest, 12 = best

Table 3. Proportions (%) of hot carcass weight (mean ± standard error) in various portions of the carcass in yearling Fallow bucks compared to Axis bucks.

| Parameter | Species | | |
|---|---|---|---|
| | Fallow | Axis | Probability |
| Leg - bone in | 30.3 ± 0.3 | 31.6 ± 0.3 | P < 0.03 |
| Tenderloin | 1.4 ± 0.2 | 1.9 ± 0.2 | P < 0.09 |
| Sirloin - boneless | 9.8 ± 0.3 | 10.8 ± 0.4 | P < 0.05 |

## COMPARISON OF GROWTH AND CARCASS CHARACTERISTICS OF YEARLING EUROPEAN WITH 1/4 MESOPOTAMIAN FALLOW BUCKS

**Background.** Crossbreeding has become a standard production tool for animal production. The Mesopotamian Fallow is larger than the European Fallow and offers the option for crossbreeding to the Fallow deer farmer or rancher. The objective of this experiment was to evaluate growth from weaning to slaughter and carcass traits in European and 1/4 Mesopotamian Fallow bucks.

Twenty eight 1/4 Mesopotamian Fallow bucks were transported from Yancey, Texas after weaning in October, 1995. Six European Fallow bucks produced at the Texas Agricultural Experiment Station at Overton were weaned in October, 1995 and commingled with the 1/4 Mesopotamian Fallow bucks. Prior to availability of rye-ryegrass pastures the bucks were kept in drylot and received 3% of their body weight of 2:1 alfalfa pellets:ground corn and free choice Coastal bermudagrass hay, salt, minerals and water. The bucks grazed rye-ryegrass pastures from January through April and Coastal bermudagrass pastures from April through August with free choice access to water, salt and minerals. The bucks were weighed at 28 day intervals throughout the 291 day experimental period. Carcass data collected included hot carcass weight, dressing percent, carcass and leg conformation scores, leg weight (bone in), neck and shoulder weight, rib weight and boneless sirloin weight.

**Research Findings.** Body weight gains were greater ($P<0.002$) in 1/4 Mesopotamian Fallow bucks than in European Fallow bucks (Table 1). This greater gain in body weight resulted in greater live weight at slaughter ($P<0.002$) and hot carcass weight ($P<0.004$) in 1/4 Mesopotamian compared to European Fallow bucks (Table 2). Dressing percent was similar in both types of Fallow bucks (Table 2).

Carcass and leg conformation scores (1-12) were better ($P<0.03$) in 1/4 Mesopotamian than in European Fallow bucks (Table 2). Weight of the leg (bone in) was similar in both types of Fallow bucks (Table 2) and made up a greater percentage of hot carcass weight ($P<0.02$) in the European compared with the 1/4 Mesopotamian Fallow bucks (Table 3). Weight of the neck and shoulder (Table 2) was greater ($P<0.005$) in 1/4 Mesopotamian than in European Fallow bucks but made up a similar percentage of hot carcass weight in each type (Table 3). Weight of the rib (Table 2) was greater ($P<0.0001$) in 1/4 Mesopotamian and made up a greater ($P<0.0001$) proportion of hot carcass weight (Table 3) than in European Fallow bucks. Weight of the boneless sirloin (Table 2) was greater ($P<0.03$) in 1/4 Mesopotamian and made up a greater ($P<0.02$) percentage of hot carcass weight (Table 3) than in European Fallow bucks.

**Application.** Crossbreeding of Mesopotamian Fallow with European Fallow results in improved average daily gains, greater slaughter and hot carcass weights and improved carcass and leg confirmation. Crossbreeding increased the proportion of hot carcass weight in the rib and sirloin and decreased the proportion in the leg without affecting the proportion of neck and shoulder. A clear economic advantage was obtained by the use of crossbreeding Mesopotamian with European Fallow for venison production.

Table 1. Body weight gains (mean ± standard error) from weaning through slaughter in yearling European Fallow bucks compared to 1/4 Mesopotamian Fallow bucks.

| Parameter | Animal Type | | |
|---|---|---|---|
| | European | 1/4 Mesopotamian | Probability |
| 291 day weight gain (lb) | 46.8 ± 2.6 | 56.6± 1.2 | P < 0.002 |
| Average daily gain (lb) | 0.161 ± 0.009 | 0.194± 0.004 | P < 0.002 |

Table 2. Comparison of carcass characteristics (mean ± standard error) of Yearling European Fallow bucks compared to 1/4 Mesopotamian Fallow bucks.

| Parameter | Animal Type | | |
|---|---|---|---|
| | European | 1/4 Mesopotamian | Probability |
| Liveweight (lb) | 99.5 ± 3.1 | 111.5 ± 1.5 | P < 0.002 |
| Hot carcass weight (lb) | 54.0 ± 1.7 | 60.1 ± 0.8 | P < 0.004 |
| Dressing percent | 54.3 ± 0.5 | 53.9 ± 0.2 | P > 0.1 |
| Carcass confirmation score (1-12)[a] | 3.0 ± 0.4 | 4.0 ± 0.2 | P < 0.03 |
| Leg confirmation score (1-12) | 3.6 ± 0.5 | 4.9 ± 0.2 | P < 0.03 |
| Leg weight - bone in (lb) | 20.2 ± 0.6 | 20.9 ± 0.3 | P > 0.1 |
| Neck and shoulder weight (lb) | 15.8 ± 0.4 | 17.1 ± 0.2 | P < 0.005 |
| Rib weight (lb) | 3.8 ± 0.3 | 6.0 ± 0.2 | P < 0.0001 |
| Sirloin - boneless (lb) | 9.9 ± 0.3 | 11.1 ± 0.3 | P < 0.03 |

[a]1 = poorest, 12 = best

Table 3. Proportions (%) of hot carcass weight (mean ± standard error) in various portions of the carcass in yearling European Fallow bucks compared to 1/4 Mesopotamian Fallow bucks.

| Parameter | Animal Type | | |
|---|---|---|---|
| | European | 1/4 Mesopotamian | Probability |
| Leg - bone in | 37.6 ± 0.9 | 34.8 ± 0.4 | $P < 0.02$ |
| Neck and shoulder | 29.2 ± 0.6 | 30.0 ± 0.4 | $P > 0.1$ |
| Rib | 7.0 ± 0.5 | 10.4 ± 0.3 | $P < 0.0001$ |
| Sirloin - boneless | 18.0 ± 0.7 | 20.5 ± 0.6 | $P < 0.02$ |