Factors Affecting Fallow Weight Gain

by G.W. Asher

SUCCESSFUL fallow deer farmers need to understand what controls fallow deer growth: increasing or decreasing day length; seasonal changes in liveweight and behavior; castration; and grazing and feeding management.

Effect of day length

Seasonal variations in voluntary feed intake have been found with several species of deer (fallow, mule, whitetail, roe, and red deer) and also some sheep breeds. Characteristically, feed intake is lowest over winter and highest in spring and summer.

Studies with red deer have shown that the annual day length (photoperiod) cycle is the stimulus to the annual appetite cycle. Increasing photoperiod (spring and summer) was found to result in increased voluntary feed intake by stags penned indoors. Equally, decreasing photoperiod (autumn and winter) resulted in a reduced voluntary intake. Using artificial light to provide a shorter six-month cycle of photoperiod changes, but a 12-month ambient temperature cycle, resulted in two peaks and two troughs of feed intake with penned red deer stags over a 12-month period.

Seasonal behavior

Although liveweight gains of fallow deer are affected by season, the actual pattern of change varies with animal age and sex. Typically, fallow commence fawning in summer. The suckling period can extend for eight months, but, on farms, generally ends after 100 days with weaning in late March (September in U.S.; don't forget, New Zealand's calendar is upside down). Over this suckling period, fawns of both sexes grow faster than at any subsequent time. In addition, buck fawns grow faster than doe fawns.

After weaning, autumn growth rates of fawns at pasture are generally no more than 50 percent of those before weaning.

A further reduction in growth rate occurs over the winter when fawns are between six and nine months of age. In early spring, fawn growth rates increase in line with increases in pasture growth and quality. The extent to which the surge in liveweight gain over spring is kept up over the summer will depend on pasture management over spring. In particular, the prevention of seed head formation on grasses during spring will help in maintaining pasture quality through the summer. For ryegrass/white clover pastures, both summer temperatures and rainfall are important determinants of pasture production.

By the end of their second summer — at about 14-16 months of age — both bucks and does are approaching puberty. At this age, bucks may, at best, maintain their autumn liveweights through the ensuing six months to the following spring. Unlike the situation of a year earlier, two-year bucks do not gain weight over their second autumn and winter.

Following the onset of puberty at about 14 months of age, uncastrated males can become difficult to handle, particularly during yarding. However, many producers take this as an opportunity to send for slaughter those bucks not required for breeding. At this time, carcass weights of bucks have proved acceptable to venison processors. In addition, carcasses typically averaging about 54 pounds were shown to contain as little as seven percent chemical fat.

After puberty, fallow bucks exhibit an annual liveweight cycle which is most marked when they are used as sires. Over the rutting season, sire

No weight gain — perhaps even a 25 percent loss — for second-year fallow bucks during rut: *fallow stag, this one at Lucky Star Ranch, Chaumont, New York.*

The author is one of New Zealand's leading university experts on fallow deer husbandry. Article adapted with his kind permission from ***Progressive Fallow Deer Farming, 2nd edition****, published by the New Zealand Ministry of Agriculture and Fisheries, with 1992 revisions sponsored by Heart-Bar Deer Farms, San Antonio, TX.*

bucks may lose up to 25 percent of their pre-rut liveweight. Mixed-age females also show an annual cycle of liveweight, but fluctuations are less marked than for bucks, with the increase in pre-fawning liveweight reflecting the weight of the unborn fawn and the products of conception.

Castration

After puberty, uncastrated (entire) males not only become more difficult to handle, but are also more antagonistic toward each other during the breeding season. As a consequence, groups of entire bucks are not usually yarded at this time. Where markets require an all year round supply of chilled venison, this can be restrictive.

One possible way to extend the killing season is by castrating bucks. In one of the earliest trials at the Ruakura Agricultural Centre, bucks were allocated to two unequal sized groups which were balanced for birth date, birth weight, and weaning weight. Eleven bucks on the one group were castrated at 11 months of age and those in the larger group - 21 - were left intact. The two groups of animals were grazed as one mob to about 27 months of age.

Pre-weaning growth rates up to 3.5 months of age for both groups averaged 6.6 ounces per day; between weaning and castration, 2.7 ounces per day. From this latter time until nine months of age, both entire and castrated bucks grew slowly at the same rate of 1.2 ounces per day. However, from the start of spring, the mean growth rate of entire (uncastrated) bucks was 4.4 ounces per day, compared to 3.4 ounces per day for the castrated group. Over the summer period (from 12 to 15 months of age) the uncastrated bucks averaged 1.6 ounces per day, with castrates averaging 0.9 ounces per day.

By 15 months of age, castrated bucks were 9.8 percent lighter than uncastrated ones. By 27 months, this difference increased to 14 percent.

Feeding levels

Presently, there are no published estimates of feed or energy required by fallow deer at pasture. However, as a guide, feeding levels for fallow have been calculated from liveweight/energy intake relationships found with red deer. Contained in these estimates are allowances for growth, season, and, in the case of females aged 2-years and over, an allowance for milk production intended to support fawn growth rates of around 6.4 ounces per day over summer. From what has already been discussed, it will be appreciated that rutting bucks are unlikely to consume their estimated feed requirement. As a consequence, such animals loose considerable liveweight over the rut — up to 15 ounces per day for a 30 day period.

Grazing management

Studies were undertaken at the Ruakura Agricultural Centre to determine the effect of stocking rate (animal density on pasture) on growth and venison production from young fallow bucks grazing ryegrass/white clover pastures. Newly weaned four-month-old bucks were allocated to two stocking rate treatments of 13 and 20 animals per acre. In each year initial liveweights and the source of stock was the same for each treatment. Each group of bucks was rotationally grazed on its own 1.1-acre farmlet which was divided into eight paddocks. Grazing periods varied from two to seven days depending on the season and year, with paddock changes being made on the same day, within years, for each stocking rate.

Bucks were weighed at 28-day intervals and slaughtered at 14 months of age.

Bucks exhibited seasonal patterns of growth between four and 14 months of age at both stocking rates. In each of the two years, daily liveweight gains were highest in spring and lowest over winter. All bucks reached a final slaughter liveweight of around 97-99 pounds regardless of stocking rate. Daily intakes of pasture dry matter by bucks ranged from 1.5 pounds at four to six months up to 2.9 pounds at 14 months.

The mean hot carcass weight at 14 months of age was only slightly heavier for bucks at the lower stocking rate in each of the two years of the trial. However, the total carcass yield per acre was approximately 45 percent higher for the higher-stocked bucks. The fact that average carcass weights were not more markedly depressed as the stocking rate increased from 13 to 20 bucks per acre suggest that even higher stocking rates were possibly justifiable.

Seasonal imbalances

A number of differences in the patterns of feed demand exist between fallow deer and more traditional livestock. These arise due to the late onset of fawning and the seasonal pattern of liveweight growth. Whereas pasture growth exceeds the demands of deer over spring, the reverse occurs over summer and autumn. Consequently, summer pasture growth appears an important limitation to increased on-farm production. Essentially, the primary constraint to increased production is the poor alignment between the feed demands of deer and pasture production *(Editor's note: this may make deer farming distinctly different from "traditional" forms of livestock farming in New Zealand, but it's exactly what northern U.S. beef, sheep, and dairy farmers have always faced).* One consequence of this can be a markedly seasonal venison kill of 14-16 month-old bucks over the late summer/early autumn period before their growth stops for up to six months.

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Calculated feed requirements of fallow deer (pounds of dry matter per day)

		Season			
	March liveweight	Autumn 100 days	Winter 65 days	Spring 100 days	Summer 100 days
Young bucks					
0.25 to 1.25 yr.	44 lb.	2.2 lb.	2.2 lb.	2.6 lb.	2.9 lb.
1.25 to 2.25 yr.	103 lb.	2.6 lb.	3.1 lb.	2.9 lb.	3.3 lb.
Sire bucks					
2 yr.	143 lb.	3.5 lb.	3.1 lb.	3.3 lb.	4.0 lb.
3 yr.	187 lb.	4.2 lb.	4.0 lb.	3.7 lb.	4.4 lb.
4+ yr.	230 lb.	5.1 lb.	4.8 lb.	4.6 lb.	5.3 lb.
Does					
0.25 to 1.25 yr.	40 lb.	2.0 lb.	2.0 lb.	2.0 lb.	2.4 lb.
1.25 to 2.25 yr.	84lb.	2.4 lb.	2.6 lb.	2.9 lb.	4.4 lb.
Breeding does					
	99 lb.	2.6 lb.	2.6 lb.	2.9 lb.	4.6 lb.
	120 lb.	3.1 lb.	3.1 lb.	3.3 lb.	5.1 lb.

Fallow weight gain

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Concentrate feeding

The equable year-round climate in New Zealand is conducive to year-round grazing systems. Feeding of concentrate rations or conserved pasture (hay or silage) is largely restricted to periods of relative pasture deficit in winter or late summer. Such feeding is usually in the form of supplementary rations rather than an exclusive diet.

Winter supplementation generally aims to provide deer with an adequate energy intake to offset heat loss by increasing heat production. Therefore, it is usual to provide deer with supplements high in energy rather than protein. Available winter pasture will generally provide adequate protein to over-wintering deer.

Summer supplementation during periods of drought is often directed at maintaining high lactational yields of does rearing fawns. As milk production involves considerable investment by the doe into energy and protein metabolism, consideration may need to be given to supplementation of both energy and protein intake.

In general terms, cereal grain feeds (oats, corn, barley) have high energy value but very low protein value. Feeds such as alfalfa hay, lupin grain, soybeans, and other legume-type crops generally have high protein contents. The choice of supplementary feed will be dependent on the desired nutrient and local availability and cost.

In North America, climatic conditions are considerably more extreme than in New Zealand. It is not uncommon for farmers to provide a total concentrate diet to fallow deer for periods of six months during winter. This situation contrasts markedly with supplementary feeding and the choice of feeds needs to be considered carefully. In particular, a balanced diet should be provided under semi-feedlot conditions. Again, the choice of feedstuffs will depend on cost and local availability. It is generally recommended that winter feed rations for fallow deer contain 10-12 percent protein. In North America, this is usually obtained by incorporation of alfalfa hay and soybeans meal within a corn grain base, often in pelletized form.

When feeding concentrate rations to fallow deer, care should be taken to introduce new feedstuffs slowly to their diet. Rumen flora require a period of time to adjust to new rations. Sudden introduction to different diets will, at best, lead to short-term scouring and, at worst, lead to rumen overload and acidosis, often fatal.

Consideration should also be given to preventing dominant individuals from hoarding feed and denying access to subordinate animals. This is best achieved by distributing the rations in long feed troughs. □