THE EFFECT OF PERIOD OF STAY ON THE PRODUCTIVITY OF PASTURE BEEF SYSTEMS

R.C. Martin[1], A.H. Fredeen[1], N. Boyd[1], Y.A. Papadopoulos[2] and E. Charmley[2]
[1] Nova Scotia Agricultural College, Truro, Nova Scotia B2N 5E3
[2] Agriculture and Agri-Food Canada, Experimental Farm, Nappan, Nova Scotia B0L 1C0

ABSTRACT
The objective of this study was to compare the average daily gains (ADGs) of beef cattle under management intensive grazing in paddocks with one-day and six-day periods of stay and to assess yellow fat on carcasses of cattle finished on pasture. The ADGs over the season were higher under the one-day than the six-day period of stay in 1994, but in 1995, the opposite trend was evident although the differences were not significant. In 1995, none of the 32 cattle tested were downgraded for the presence of yellow fat.

KEYWORDS
Beef, average daily gain, management intensive grazing, yellow fat, period of stay

INTRODUCTION
Forage growth is exceptional in Atlantic Canada in May and June and usually more than adequate during the summer months. Given this comparative advantage, rising grain prices, and the fact that 70% of the beef consumed in Nova Scotia is still imported, more beef could be grown on Nova Scotian pastures. However, there has been a reluctance to finish cattle on pastures because they might be down-graded for yellow fat on carcasses.

Forage should be grazed before shading from excess leaf area reduces growth rates but it should not be grazed to the point of low leaf areas that might retard regrowth (Parsons and Johnson, 1986 and Murphy, 1991, pp.103-114). In fact, Murphy (1991, p.111) advises farmers to avoid leaving cattle in a paddock for more than a two day period of stay because some plants will regrow enough to be grazed again before the cattle are moved. This can deplete plant root reserves. However, less frequent moves may encourage faster adoption of management intensive grazing (MIG) and save farmers valuable time. Therefore, in this study, MIG was tested with a one-day and a six-day period of stay and all cattle were marketed directly from pasture to assess yellow fat on carcasses.

METHODS
In 1994 and 1995, a 6.4 hectare field was divided into four strips of 50 m by 320 m and grazing beef cattle were moved from paddock to paddock, within the strips. Water and minerals were available to all cattle at all times, using moveable float tanks and mineral boxes. The paddock sizes were increased if the residual forage was less then 5 cm tall or if the forage in the new paddock exceeded 20 cm. The paddock sizes were reduced if the residual forage exceeded 7 cm or the available forage was more than 25 cm in the new paddock. If the first paddock of an experimental unit was ready for regrazing, before all the paddocks had been grazed in a rotation, the remaining ungrazed paddocks were mowed. Cattle were weighed on two consecutive days at the beginning and end of each season, on a portable Paul scale. The cattle were assigned to each experimental unit according to individual weights at the beginning of the project. The initial total weights, determined after a 10 day adjustment period to the pasture, were approximately equal for all experimental units. All of the cattle had Hereford dams and Simmental or Shorthorn sires.

From July 19 to October 6, 1994, an MIG system was tested with one experimental unit in each of the four strips. Two treatments were randomly assigned within each of two replicates. In the first treatment, six cattle were moved from paddock to paddock every day (one-day period of stay) and in the second treatment, six cattle were moved every six days (six-day period of stay).

From May 23 to September 20, 1995, two experimental units were applied to each strip with one of two treatments randomly assigned to each end of the strips. Therefore, each of the four strips was a replicate. In the first treatment, four cattle were moved from paddock to paddock every day and in the second treatment, four cattle were moved every six days. In 1995, the cattle were also weighed on July 5, August 2 and August 29. All carcasses were tested for the presence of yellow fat.

RESULTS AND DISCUSSION
In 1994, the average daily gain (ADG) of cattle under the one-day period of stay was 1.18 kg/day and each animal required 65.6 m^2 pasture/kg gain/day. During the same time, the ADG of cattle under the six-day period of stay was 1.09 kg/day, however they required 82.9 m^2 pasture/kg gain/day. The average percent clover was 56.7 and 52.3 under the one and six-day periods of stay, respectively. The 20% gain in land use efficiency may not be important to farmers with plenty of grazing land but others with limited acreage, especially near farm buildings, might value land use efficiency.

In 1995, the ADG between May 24 and July 5 was significantly higher under the six-day period of stay ($P = 0.0001$). The six-day period of stay also resulted in numerically higher ADGs at the next two weighings but the differences were not significant. However, between August 29 and September 20 when there was some moisture stress, those under the one-day period of stay gained significantly more ($P = 0.0021$). The ADGs for the season were 1.01 kg/animal/day under the one-day period of stay and were not significantly different than 1.07 kg/animal/day under the six-day period of stay. The average percent clover was 21.7 and 17.0 under the one and six-day periods of stay, respectively. The relatively wet summer may have caused a decline in clover competitiveness with grass, compared to 1994. The lower ADGs in 1995 may be partially due to the clover decline since ruminant performance can be improved by increasing the amount of legumes in a pasture (Forwood et al., 1989). During the first three rotations of 1995, the cattle under the six-day period of stay required less area ($P < 0.01$) than those under the one-day period of stay. However, significantly less area was needed during the last rotation ($P < 0.01$) under the one-day period of stay. The required seasonal total area was greater under the one-day period of stay but the difference was not significant. In 1995, the 32 cattle were slaughtered immediately after being removed from pasture and tested for yellow fat. None of them were downgraded for the presence of yellow fat.

Originally we hypothesized that the animals moved daily would gain more because the grass would be in better condition (Morrow et al., 1991). However, in 1995, the animals anticipated the move each morning. Instead of grazing, they watched and waited until the new paddock was prepared. Funston et al (1991) reported that cattle graze most from 6:00 to 9:00 am and from 6:00 to 9:00 pm. Our cattle

were moved at approximately 9:00 am. The time spent waiting to be moved may have interfered with a major grazing period. In 1994, cattle gained more under the one-day than the six-day period of stay but they were moved at 2:00 pm.

In conclusion, the ADGs over the season were higher under the one-day than the six-day period of stay in 1994 but in 1995, the opposite trend was evident although the differences were not significant. In 1995, none of the 32 cattle tested were downgraded for the presence of yellow fat.

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