

# Ewe prolificacy and stocking rate

**TEAGASC** sheep researchers are investigating ewe prolificacy and stocking rate in grass-based lamb production systems.

The production of lamb in grass-based production systems is principally based upon the utilisation and conversion of herbage into lamb carcass. Successful grazing systems require animals that can efficiently convert feed into a high-value product. At present, lamb production systems are limited by the efficiencies at which they operate, such as the number of lambs weaned per ewe and the level of herbage utilised per hectare. In order to remain competitive, improvements in the efficiency of such systems are of paramount importance. Ewe prolificacy potential and stocking rate are two of the most influential factors affecting lamb output and the efficiency at which feed resources are utilised in grass-based lamb production systems.

## Athenry research demonstration farm study

A prolificacy potential by stocking rate study, consisting of two ewe prolificacy potentials (medium prolificacy potential [MP; Suffolk X ewes; 1.5 lambs reared per ewe] and high prolificacy potential [HP; Belclare X ewes; 1.7 lambs reared per ewe]) and three stocking rates (SR): low (10 ewes/ha); medium (12 ewes/ha); and, high (14 ewes/ha) was conducted. Each group was managed in a rotational grazing system. Detailed measurements were undertaken with regard to animal performance and output, as well as the level of grass production and utilisation supporting the systems.

## Biological performance and output

**Table 1** shows the effect of ewe prolificacy level and stocking rate on lamb performance in terms of lifetime average daily gain and days to slaughter, as well as on total carcass output and the proportion of lamb carcass output achieved from grazed grass. Increasing stocking rate decreased individual animal performance and increased days to

slaughter. There was no difference in the days to slaughter data for the 10 and 12 ewes/ha groups, but days to slaughter were significantly higher for the 14 ewes/ha group. Prolificacy level had no effect on lifetime average daily gain or days to slaughter. There was no effect of prolificacy level on the proportion of lambs finished from a grazed grass-based diet. Stocking rate did have a significant effect on the proportion of lambs finished from grazed grass, with the lowest level achieved in the 14 ewes/ha group.

Ewe prolificacy potential and stocking rate are two of the most influential factors affecting lamb output and the efficiency at which feed resources are utilised in grass-based lamb production systems.

## Grass utilisation

**Table 2** shows the grass utilisation levels for the systems and what it means in terms of grass utilised per hectare, per ewe and per kilogram of lamb carcass produced. The important point to note here is that a significantly higher quantity of total dry matter (DM) was required to support the 14 ewes/ha group compared to the 10 and 12 ewes/ha groups on a per ewe basis. This was largely due to

**Table 1: The effect of ewe prolificacy potential and stocking rate on biological performance and output.**

Parameter	Prolificacy			Stocking rate	
	Medium	High	Low	Medium	High
Lifetime average daily gain (g/day)	218	216	231	219	200
Days to slaughter	215	215	203	213	230
Total lamb carcass produced (kg)	346	396	321	368	424
Proportion of lamb carcass produced off grazed herbage	0.85	0.85	0.91	0.85	0.79

**Table 2: Effect of ewe prolificacy potential and stocking rate on grass utilised per hectare, per ewe and per kg of carcass produced.**

Parameter	Prolificacy			Stocking rate	
	Medium	High	Low	Medium	High
Grass utilised (kg DM/ha)	10,449	10,347	8,306	10,038	12,849
Grass DM utilised/ewe (kg)	864	859	831	837	918
Grass DM/kg carcass (kg)	30	26	26	27	31

the higher days to slaughter for lambs at this stocking rate level group, which required feeding for longer compared to the lower stocking rate groups. There was no effect of ewe prolificacy level on herbage DM production or utilisation.

Results from this study demonstrate high prolificacy ewes to be more efficient in the production of lamb.

**System efficiency**

The higher demands from the extra lambs within the high prolific systems (+0.2 lambs/ewe) would appear to be cancelled out by the lower maintenance requirements of the high prolific ewes, due to their lower mature bodyweight compared to the medium prolific ewes. On an efficiency basis, taking into account the total kilograms of lamb live weight weaned per kilogram of ewe live weight mated, the high prolificacy potential ewes were 5% more biologically efficient, which is additional to the direct benefit of prolificacy.

**Implications for industry**

Results from this study demonstrate high prolificacy ewes to be more efficient in the production of lamb. Increasing stocking rate provides the opportunity to increase lamb carcass output per ha;

however, achieving this increase in output required additional grass DM per ewe and lamb unit above 12 ewes/ha. The appropriate stocking rate for a farm will be dictated by its grass-growing potential to support a given stocking rate. Increasing ewe prolificacy should always be the first priority, while increasing stocking rate must always be done in conjunction with increased grass production and utilisation.

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