

**Crossbred ewe performance in the Welsh hills**  
**Report on lamb performance to data (2003 – 2006)**

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## **Introduction**

Incomes of hill farms, measured by gross margin per farm, have decreased by 45% over the last 20 years. This in turn has put increased constraints on labour available for specific tasks during the sheep year. Consequently, farmers must identify and adopt potential changes to their current systems to maintain incomes and minimise labour inputs.

Increasing the productivity and improving the quality of their stock are practical options which could be achieved by changing to a bigger hill ewe, improving the genetic base of their current stock or by using crossbred ewe lambs as flock replacements. Using a bigger hill breed would increase kg of lamb produced per ewe but would not necessarily meet current market requirements in terms of conformation or fat class. Improving the genetic base of a flock is a long-term investment even when part of a group breeding scheme. Although hill farmers do produce crossbred lambs, traditionally the female lambs are sold for crossing with a terminal sire breed and the male lambs become part of the slaughter generation. The hybrid vigour associated with a crossbred ewe is then capitalised by the purchaser rather than the hill farmer. Switching to a crossbred ewe in the hills could offer advantages in that kg of lamb per ewe would be increased and, using crossing sires with desirable conformation traits and lean:fat ratios, lambs produced would be nearer to market requirements. However, the question remains as to whether the hybrid vigour of the crossbred ewe can be exploited in the hills, and to what extent traits such as hardiness are compromised.

## **Objectives of the Project**

The overall objective of the project is to monitor the physical and financial performance of crossbred ewes under a hill management system. The project has two phases, Phase 1 was the production of the crossbred females with Phase 2 being their evaluation. The objectives of phase 1 and phase 2 have been outlined in a previous report (Crossbred ewes in the hills, 2005).

This report will deal only with the evaluation phase and will report on the performance to data of all cohorts of crossbred ewes.

## **Experimental Protocol**

The overall experimental protocol has been described in previous reports.

All ewes are brought to in-bye land for flushing 3 weeks prior to tupping, at which point they are weighed and body condition scored.

Body condition scoring is on a tactile measure based on a scale of 1 – 5 to the nearest quarter score, where 1 is thin and 5 is obese.

Suffolk rams have been chosen as the terminal sire for the evaluation phase. All rams are sourced from the Suffolk Sire Reference Scheme and are in the top 20% of the scheme. In each year, 10 rams are used as terminal sires. Natural service is used. After 4 weeks, Suffolk rams are removed from the groups and sweeper Welsh Mountain rams used to cover any repeats.

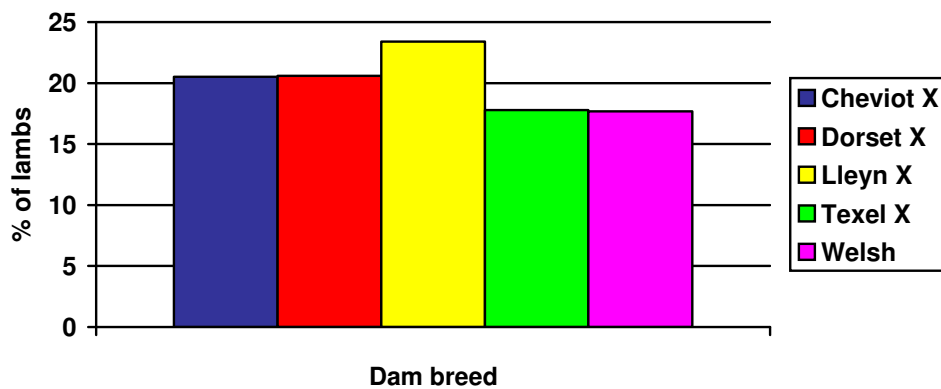
All females are pregnancy scanned in early January and all twin-bearing ewes housed. In years 2 and 3 of the evaluation phase all primiparous ewes were also housed.

All lambs are weighed at birth, 8 and 18 weeks of age. Lambs are weaned at 18 weeks of age. From weaning, all lambs are assessed fortnightly for those that have reached a finished condition of fat class 2/3L. Prior to being sent to slaughter, all lambs are weighed on-farm to obtain a final finished liveweight and are ultrasonically scanned for eye muscle and back fat depth. Hot carcass weights and gradings are obtained on the day from the abattoir.

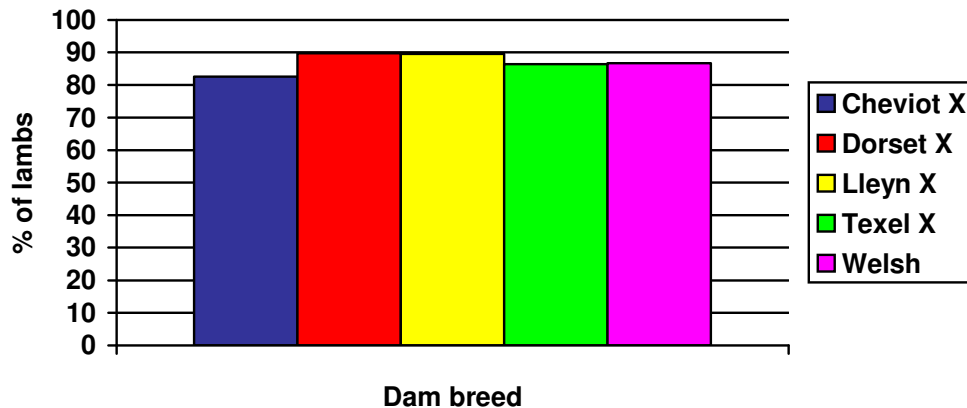
## Results

Over the four years of lifetime performance recording being conducted on crossbred ewes a total of 2,219 lambs have been recorded alive at birth with 1,933 lambs being recorded at weaning (87.1% of lambs recorded at birth being recorded at weaning).

**Figure 1: Percentage of lambs by dam type at birth**



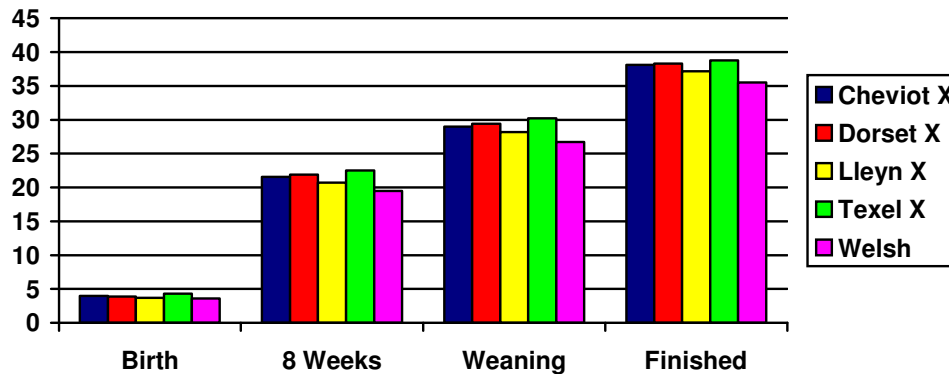
**Figure 2: Percentage of lambs surviving from birth to weaning by dam type**



Lamb performance to date is depicted graphically in Figure 3. Lambs from Texel X ewes tend to be heavier at birth (4.3 kg) compared to the other crossbred ewes and the Welsh Mountain ewes (3.6 kg). At 8 weeks, lambs raised by Texel X ewes were heavier (22.5 kg) than others whereas lambs

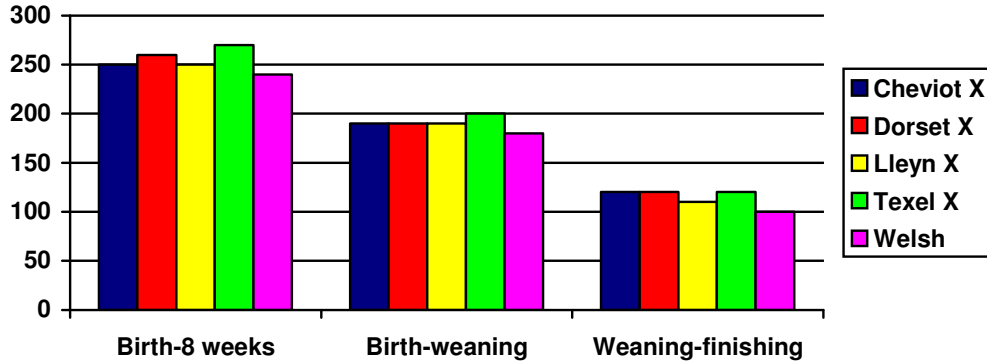
from Cheviot X (21.6 kg) and Dorset X (21.9 kg) ewes had similar 8 week weights. At weaning the same differences were still clear with lambs from Texel X ewes being the heaviest (30.2 kg)

**Figure 3: Lamb liveweights (kg) at birth, 8 weeks, weaning and finished by dam type**



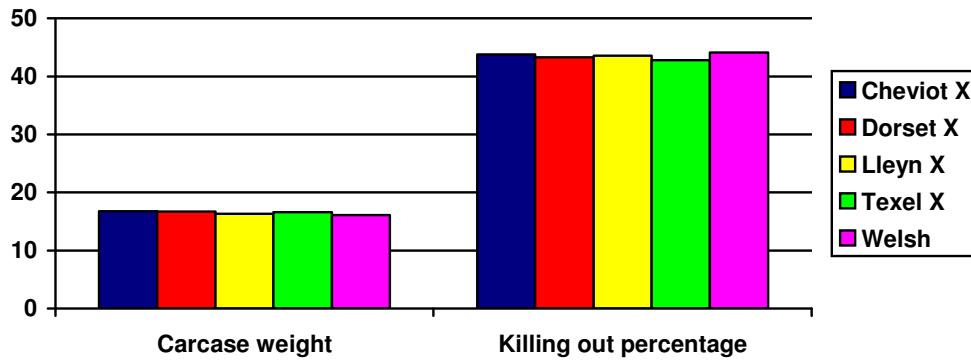
Daily liveweight gains between birth and 8 weeks was greatest for lambs from Texel X ewes (270 g/day) and least for lambs from Welsh Mountain ewes (240g/day). Lambs from Cheviot X and Lley X ewes had liveweight gains of 250 g/day with lambs from Dorset X ewes having gains of 260 g/day. Lamb growth rates from birth to weaning followed a similar pattern. From weaning to finishing lamb growth rates were similar for lambs from Cheviot X, Dorset X and Texel X ewes (120 g/day) with lambs from Lley X ewes having a slightly lower growth rate (110 g/day) and lambs from Welsh Mountain ewes having the lowest growth rate (100 g/day).

**Figure 4: Lamb growth rates (g/day) from birth to 8 weeks, birth to weaning and weaning to finishing**



Average finished weight of lambs was over 38 kg for lambs from Cheviot X, Dorset X and Texel X ewes with lambs from Lleyn X being over 37 kg on average and lambs from Welsh Mountain ewes being 35.5 kg. Carcass weights were similar for all lambs averaging over 16 kg (16.1 – 16.8 kg). Lambs from Welsh Mountain ewes had the highest killing out percentage (44.1%) whereas lambs from Texel X ewes had the lowest killing out percentage (42.8%).

**Figure 5: Carcase weights (kg) and killing out percentages (%) of lambs from different crossbred ewes**

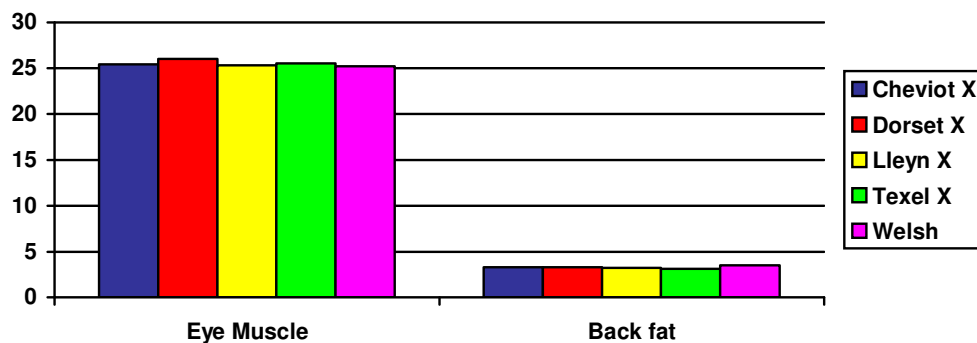


Lambs from Texel X ewes were finished at an average age of 29 weeks, whereas lambs from Cheviot X, Dorset X and Lleyn X ewes were finished at

an average age of 30 weeks. Lambs from Welsh Mountain ewes were finished at 31 weeks of age on average.

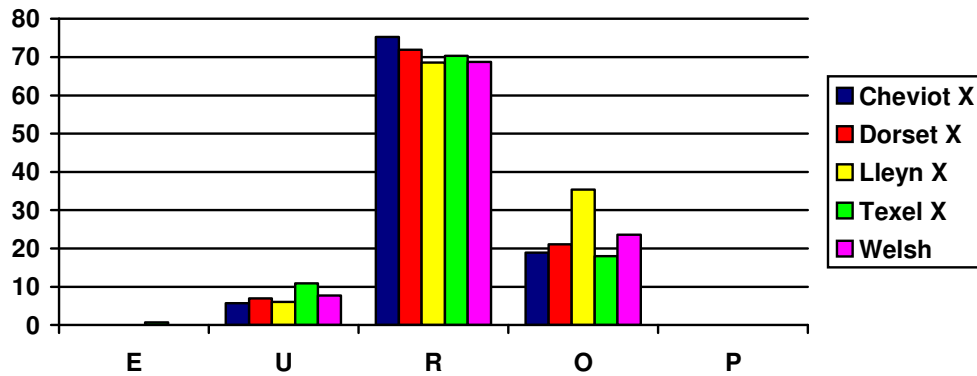
Eye muscle and back fat depth were recorded using ultrasonic scanning and the results are depicted in Figure 6 below. Eye muscle depth was greatest in lambs from Dorset X ewes (26.0 mm) and least in lambs from Welsh Mountain ewes (25.2 mm). Eye muscle depths in lambs from other crossbred ewes ranged through 25.5 mm (Texel X), 25.4 mm (Cheviot X) to 25.3 mm (Lleyn X). Lambs from Texel X ewes were leanest with the least back fat depth (3.1 mm) followed by lambs from Lleyn X ewes (3.2 mm). Lambs from Cheviot X and Dorset X ewes had similar back fat depths (3.3 mm) and lambs from Welsh Mountain ewes had the greatest back fat depth (3.5 mm).

**Figure 6: Eye muscle and back fat depth measured ultrasonically.**



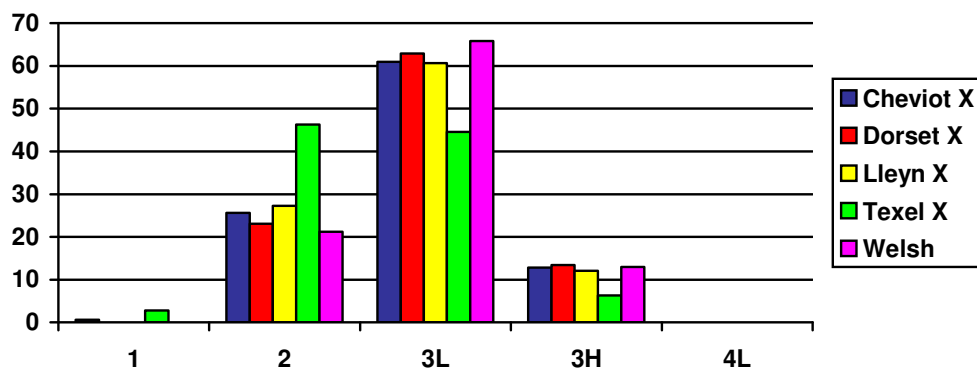
Carcase gradings were also recorded for finished lambs and the percentage of lambs finished in each EUROP classification by dam type are depicted in Figure 7. Only lambs from Texel X ewes were graded as E and this was less than 1% of lambs. Over 80% of lambs graded as R or better for lambs from Cheviot X, and Texel X ewes. More than 20% of lambs from Dorset X, Lleyn X and Welsh Mountain ewes graded as O.

**Figure 7 Percentage of lambs finished in each EUROP classification by dam type.**



All lambs were selected for a fat class of 2/3L with over 80% of lambs from each dam type achieving this target. Percentage of lambs in each of fat class by dam is depicted in Figure 8.

**Figure 8: Percentage of lambs by dam type in each of the different fat classes.**



## Discussion

Performance of lambs from crossbred ewes was higher than lambs from pure Welsh Mountain ewes. By applying a ranking system to each performance parameter an overall ranking was produced for lambs by dam type (See Table 1 below). Using the ranking system, lambs from Texel X ewes have the most improved performance followed by lambs from Dorset X Cheviot X and Lleyn X ewes.

**Table 1: Ranking system for overall lamb performance**

Performance Parameter		Cheviot X	Dorset X	Lleyn X	Texel X	Welsh Mountain					
<b>Growth</b>	<b>8 week Wt</b>	21.6	3	21.9	2	20.7	4	22.5	1	19.5	5
	<b>Weaning Wt</b>	29.0	3	29.4	2	28.2	4	30.2	1	26.7	5
	<b>Finished Wt</b>	38.1	3	38.3	2	37.2	4	38.8	1	35.5	5
	<b>DLGb-8</b>	250	3	260	2	250	3	270	1	240	5
	<b>DLGB-W</b>	190	2	190	2	190	2	200	1	180	5
	<b>DLGW-F</b>	120	1	120	1	110	4	120	1	100	5
<b>Ranking</b>			<b>15</b>		<b>11</b>		<b>21</b>		<b>6</b>		<b>30</b>
<b>Finished</b>	<b>Age</b>	30	2	30	2	30	2	29	1	31	5
	<b>Eye Muscle</b>	25.4	3	26.0	1	25.3	4	25.5	2	25.2	5
	<b>Back fat</b>	3.3	3	3.3	3	3.2	2	3.1	1	3.5	5
<b>Ranking</b>			<b>8</b>		<b>6</b>		<b>8</b>		<b>4</b>		<b>15</b>
<b>Carcase</b>	<b>Weight</b>	16.8	1	16.7	2	16.3	4	16.6	3	16.1	5
	<b>KO%</b>	43.8	2	43.3	4	43.6	3	42.8	5	44.1	1
	<b>% R&gt;</b>	81.1	2	78.9	3	74.6	5	82.0	1	76.4	4
	<b>% &lt;3L</b>	87.2	3	86.6	5	87.9	2	93.4	1	87.0	4
<b>Ranking</b>			<b>8</b>		<b>14</b>		<b>14</b>		<b>10</b>		<b>14</b>
<b>Total Ranking</b>			<b>31</b>		<b>31</b>		<b>43</b>		<b>20</b>		<b>59</b>

In terms of lamb growth parameters, lambs from Texel X ewes had the best (6) ranking score, followed by lambs from Dorset X (11), Cheviot X (15), Lleyn X (19) and Welsh Mountain (30) ewes. For finished parameters again lambs from Texel X ewes had the best ranking (4) followed by lambs from Dorset X ewes (6). Lambs from Cheviot X and Lleyn X ewes had similar rankings for finished parameters (8) followed by lambs from Welsh Mountain ewes (15).

However, in terms of carcass parameters lambs from Cheviot X ewes had the best ranking (8) followed by Texel X ewes (10). Lambs from Dorset X, Lleyn X and Welsh Mountain ewes had similar ranking (14) for carcass parameters.

The difference in ranking for performance parameters for each of the different dam types suggests that careful consideration needs to be given to flock performance objectives before selecting a particular type of crossbred ewe.