Feeding the pregnant ewe – best practice

**Nutrition during early pregnancy**
In early pregnancy (0-30 days) the foetus is not yet implanted in the uterus wall and is vulnerable and so efforts must be made to avoid stressing the ewes physically or nutritionally. It is important to provide a level plane of nutrition during joining and for the following 3 to 4 weeks to increase conception rates. Diets which provide deficient (nutritive level <50% of maintenance) and excess (nutritive level = 200% of maintenance) energy during the first three weeks of pregnancy can induce embryonic mortality (even if <15%), with higher mortality rates seen in multiples than in single ovulations.

**Nutrition during mid-pregnancy**
The nutrition during the mid-pregnancy period (30-100 days) is focused on placental development. The development of the placenta is hugely important because placenta weight and lamb birth weight are highly correlated. During mid-pregnancy the ewe is just fed for maintenance and should not gain or lose much weight as it could affect placental development. Maintaining the ewes live weight in mid-pregnancy will facilitate the ewe to lamb down with the target B.C.S of 3.0.
Nutrition during late pregnancy

Appropriate nutrition and management during late pregnancy is one of the key factors influencing lamb survivability and flock productivity (lambs reared per ewe joined), and thus profitability. Correct nutrition in late pregnancy will help to produce lambs at the optimum birth weight and ewes with adequate supplies of colostrum (http://sheepnet.network/node/216).

Ewe nutrient requirements

The main nutrients required during late pregnancy are energy, protein and minerals and vitamins. Nutrient requirement increases as parturition approaches due to the rapid growth and development of the foetus/es and synthesis of colostrum.

**Energy:** The requirements for nutrients are influenced by the stage of gestation, the number of foetuses and ewe weight. During early and mid-gestation pregnancy has little impact on nutrient requirements as the foetus/es are growing at a slow rate. An increase in ewe body weight of 10 kg increases daily energy requirements for maintenance by approximately 1 MJ daily. Increasing litter size has the greatest impact on metabolisable energy (ME) requirements during late pregnancy and the impact increases weekly as parturition approaches. For single, twin and triplet bearing ewes (weighing 80kg) ME requirements increase from 11.7 to 16.1, 14.0 to 22, and 15.3 to 25.3 mj/day, respectively, from weeks 6 and 1 prior to parturition. However, ewes in late pregnancy can meet some of their energy requirement by mobilising body reserves (condition). For example, for each 100g daily weigh loss is equivalent to 2 MJ of ME. Therefore having ewes in good condition is an advantage as they can mobilise some body reserves during late pregnancy to meet requirements, at a time when the ewe may not physically be able to consume adequate food intake to meet requirements.

**Protein:** When formulating rations protein can be divided into two main types; firstly effective rumen degradable protein (ERDP) is readily broken down in the rumen and is available to the rumen microbes, secondly digestible undegradable protein (DUP) protein which passes through the rumen but is digested in the intestine. The Metabolisable Protein (MP) concentration of a diet is determined from the ERDP and DUP fractions.
Variability in the feed value of forrage

Conserved grass (silage or hay) is the basal diet offered to most ewes which are housed during pregnancy. Digestibility (DMD, DOMD, ME) is the most important characteristic of grass silage or hay from the viewpoint of animal performance because it is positively correlated with energy concentration and intake. As silage digestibility varies on farm (from 52 to 82 %) it is essential to know the feed value of the silage (forage) (as determined by laboratory analysis) that will be offered to ewes when developing a nutritional plan for housed ewes in late pregnancy.

Impact of grass silage feed value

The impact of silage feed value can be determined as follows:

1) Each 5 percentage-point increase in silage DMD increases ewe weight post lambing by 6.5 kg and increases lamb birth weight by 0.25 kg.

   OR

2) Each 1 percentage-point decrease in silage digestibility requires an extra 1.5 kg of concentrate supplementation per ewe during the final 6 weeks of pregnancy to maintain animal performance

Silage feed value and concentrate requirement

Forage feed value and expected litter size are the main factors influencing concentrate requirement during late pregnancy. Excess concentrate during late pregnancy has a minimum impact on lamb birth weight, and is converted to ewe body fat.
The effects of silage feed value on the concentrate requirement of twin-bearing ewes in late pregnancy are presented in Table 1. It is assumed that the silage is been offered using good feeding management, i.e., ewes have access to fresh forage 24 hours per day and that any silage residue is removed twice weekly. Concentrate requirement is influenced by both silage digestibility and harvest system (chop length). The main factor influencing concentrate requirement during late pregnancy is silage digestibility. For example, for silages at 79 and 64% digestibility an additional 4 and 10 kg concentrate, respectively, are required for long chop silages, compared to precision chop silages, respectively. Concentrate requirements per ewe can be reduced by 5 kg in the case of single-bearing ewes, whilst concentrate supplementation should be increased by 8 kg for ewes carrying triplets.

**Table 1.** Effects of silage quality on total concentrate requirements (kg) of twin-bearing ewes during late pregnancy

<table>
<thead>
<tr>
<th>Silage DMD (%)</th>
<th>Precision chopped</th>
<th>Big bale/Single chop</th>
</tr>
</thead>
<tbody>
<tr>
<td>79</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>72</td>
<td>17</td>
<td>24</td>
</tr>
<tr>
<td>64</td>
<td>25</td>
<td>35</td>
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</table>

**Concentrate protein**

For prolific flocks the concentrate should be formulated to contain 19% crude protein (i.e., 190 g of crude protein per kilogram as fed) as conserved grass (silage, hay) on many sheep farms has a low protein concentration.

Where maize silage is offered as the forage during late pregnancy then concentrate crude protein concentration should be increased to 23% and mineral and vitamin supplementation should be increased by approximately 50%

Concentrate protein source offered to ewes during late pregnancy influences the performance of ewes and their progeny. Lambs born to ewes offered soyabean as the main protein source are heavier at birth (0.3 kg) and weaning (0.9 kg) than lambs born to ewes offered concentrate that contained by-products (rapeseed meal, maize distillers grains and maize gluten) as the protein source. The increase in the weaning weight of lambs from ewes offered the soya bean-based concentrate in late pregnancy is similar to the response obtained from offering each lamb 6 kg of creep concentrate from birth to weaning.
Concentrate feeding management

To optimise the use of concentrate ewes should be grouped according to predicted litter size (based on ultrasonic scanning) and expected lambing date (mating date - raddle colour). As lamb weight increases by 70% during the last 6 weeks of pregnancy the demand for nutrients increases substantially during late pregnancy. Consequently, supplementation should be stepped up weekly over the weeks immediately prior to lambing.

The feed schedules required to deliver different concentrate feed levels, varying from 10 to 45 kg per ewe in late pregnancy as presented in [http://sheepnet.network/node/216](http://sheepnet.network/node/216). During the week prior to lambing ewes receive up to 1 kg daily, clearly illustrating the benefits of penning ewes according to expected lambing date as well as expected litter size. For example, for each extra week ewes are on the high level of concentrate supplementation they would consume ~7 kg concentrate - thus dramatically increasing concentrate usage.

Additional information: [https://www.teagasc.ie/media/website/publications/2016/nutrition-during-pregnancy-IFJ-Jan-2016.pdf](https://www.teagasc.ie/media/website/publications/2016/nutrition-during-pregnancy-IFJ-Jan-2016.pdf)