

Mixed grazing - the benefits



The Beef and Sheep Development Centre, run by Hybu Cig Cymru, is managed by the Welsh Assembly Government as part of Farming Connect.



About HCC

Hybu Cig Cymru - Meat Promotion Wales (HCC) is the strategic body responsible for the promotion and development of Welsh red meat and the development of the Welsh red meat industry. Its mission is to develop profitable and sustainable markets for Welsh lamb and Welsh beef for the benefit of all stakeholders in the supply chain.

HCC's five strategic goals are:

- Effective promotion of Welsh Lamb and Welsh Beef and red meat products in Wales
- Build strong differentiated products
- Improve quality and cost-effectiveness of primary production
- Strengthen the red meat supply chain
- Effective communication of HCC activities and industry issues

This booklet forms part of a series of publications produced by HCC's Industry Development team.

The Industry Development team deal with a range of issues that include:

- Technology Transfer
- Research and Development
- Market Intelligence
- Training
- Demonstration Farms
- Benchmarking

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Forward

Increasingly, livestock producers in Wales are looking at enterprise returns and concluding that cattle, particularly in hill and upland situations, are unprofitable. The decisions to reduce or initiate enterprises on livestock farms rightly include financial budgets of each enterprise. However, these budgets often overlook the additional advantages that cattle and sheep bring to these enterprises because often these benefits are difficult to separate out, difficult to quantify and in most cases, difficult to put a financial value on.

Agriculture in Wales has contributed to the natural environment, landscape and habitat diversity which without continued agricultural land-use may be adversely affected. Mixed farming (cattle and sheep) in the hill and mountain areas of Wales delivers a number of benefits that include environmental benefits, complimentary grazing resulting in better efficiency and is also a key feature in combating internal parasite resistance to anthelmintics.

Between 2005 and 2007 the total number of breeding beef females in Wales dropped by 5.5% from 370,000 to 350,000 cattle. A continuation with this trend could not only impact on efficiencies of production on the farm but also have a detrimental effect on the Welsh landscape.

This booklet outlines some of the benefits of keeping cattle and sheep on the same holding.

Forage utilisation

Cattle and sheep are both ruminants but their physical differences in terms of size and their method of consumption lead to differences in their dietary selection, dietary intake and subsequent utilisation, and in their ability to tolerate plant and microbial toxins.

	Cattle	Sheep
Grazing method	Use tongue to pull and tear	Use teeth to nibble
Minimum Sward Height	4cm	2cm
Plant parts	Not selective - consume all plant parts	Very selective – consume particular plant parts
Sward species	Select patches of ground	Select individual plants

This means that cattle and sheep have different grazing behaviours which will affect the same ground in different ways:

Sheep

- Will graze closer to cattle dung pats
- Utilise pasture that is not normally grazed by cattle
- Ensure areas of the sward remain productive and reduce need for topping
- Ensure that sward digestibility remains high throughout the season
- Reduce pasture burdens of cattle gastrointestinal worm larvae reducing drench costs

Cattle

- Avoid areas around dung pats
- Are less selective graziers
- Consume and utilise pastures that are low in digestibility
- Can help to control invasive grasses such as molinia
- Increase sward clover content
- Increase diversity in sward structure
- Create bare ground through trampling which allows seeds to germinate
- Reduce pasture burdens of sheep gastrointestinal worm reducing drench costs

Mixed grazing

Under an extensive or continuous grazing regime, cattle and sheep need not be in competition for grazing. Indeed research has shown that when grazing availability is sufficient, mixed grazing systems actually result in a 10% improvement in animal performance compared to grazing with sheep or cattle alone. This increase was in daily weight gain by both species and was partly explained by a higher utilisation of the pasture. The sheep were grazing much closer to cattle dung pats and so were using pasture that was not normally grazed by the cattle. This in turn ensured that these areas of the sward remained productive and did not become stemmy. This helped to ensure that the sward digestibility remained high, particularly during the later part of the season.

Another contributing factor was the reduction in gastrointestinal worm burdens. Most parasitic worm species (*Nematodirus* being one exception) are host-specific so grazing cattle and sheep in alternate years will help reduce the worm challenge. Grazing cattle alongside sheep on the same pasture will also reduce parasite burdens as the stocking rate of each species will normally be reduced, and cattle will certainly consume and destroy a proportion of the sheep worms on a pasture and vice-versa.



Sequential grazing

On mixed swards of perennial ryegrass/white clover, cattle tend to select less clover than sheep leading to a higher sward clover content.

Grazing trials at the Institute of Grassland and Environmental Research's Bronydd Mawr field station showed that the clover content of fields grazed by cattle was higher than fields grazed by sheep. Weaned lambs which were then grazed on the fields that had been grazed by cattle achieved an additional liveweight gain of 30g per day compared to weaned lambs grazing after sheep (Davies¹, 1997).

Effect of cow or ewe grazing on sward clover content and subsequent lamb performance

Species grazing from May to July	Clover content by August	Subsequent weaned lamb performance in August to September
Suckler cows + calves	10%	116 g/day
Ewes + lambs	4%	86 g/day

¹Davies, D.A. (1997) "Improved upland pasture: The Bronydd Mawr Story", IGER Technical Advisory Report No.2.

Grazing of cattle swards by ewes in the autumn therefore has obvious benefits;

- Helps with flushing ewes at tugging
- Helps to avoid grass winter kill
- Increases grass tillering
- Ensures a high grass quality in the subsequent year.

Under sheep only grazing, as grass growth accelerates, the grass can get ahead of sheep. If this is not prevented, subsequent grass growth is reduced and the increased stem and flower heads can impair herbage quality. When this happens, the application of cattle can quickly get the sward back under control.



Use of cattle and sheep in extensive management systems

In semi natural pastures, cattle will tolerate much lower quality forages like Nardus and Molinia and, because they have a longer retention time in the rumen, cattle can actually achieve a greater digestibility of plants than sheep. Cattle also have a higher intake relative to their metabolic rate. This allows them to be less selective and to compensate for low nutrient values in forages by consuming more.

There are also physical differences created by cattle and sheep. Cattle graze in patches and reject areas around dung pats, making the sward structure more variable. By removing biomass and dead vegetation, cattle grazing encourages new plant growth which is more attractive to sheep. In addition, due to their physical size, cattle trample vegetation creating bare ground which allows plants such as dwarf shrubs to germinate from seed. These factors combine to increase biodiversity of flora and fauna. Cattle can also reduce the ingress of scrub vegetation such as gorse and trees which can assist in extensive land management systems.

Cattle and sheep have varying tolerances to plant toxins. It can prove beneficial to selectively use both livestock species to allow appropriate management of areas known to contain poisonous or potentially harmful plants such as bracken, ragwort, St John's wort and horse tails.




Utilisation of conserved forages

Hay making depends on the removal of water from herbage to a level sufficient to allow the grass to be stored in a safe condition with minimum losses from leaf shatter and microbial spoilage. The length and effectiveness of the drying will determine the subsequent nutrient value, palatability and digestibility of the hay.

Ensilage is a naturally occurring process which effectively pickles grass and is brought about by naturally occurring epiphytic bacteria fermenting plant sugars to lactic acid. The nutrient value, palatability and digestibility of silage is dependant on the maturity of the crop, crop constituents, crop dry matter at harvest, the method of ensiling, the efficiency of sealing and contamination with animal manures or soil.



Good preservation of conserved forages is much more important for sheep than cattle. Poorly conserved forages are rejected by sheep whilst cattle appear more tolerant. Wet forage is less palatable to sheep but has little effect on intake in cattle. Silage contaminated by soil or manure is likely to contain *Listeria* and should never be fed to sheep. Mouldy silage should never be fed to pregnant animals of either species as it could cause abortion.



In clamps, spoilage is frequently seen and is usually the result of inadequate sealing and/or lack of consolidation. With big bales, damage to the wrap can also lead to microbial spoilage. Once opened, the silage is exposed to air and microbial activity starts again. If silage is not consumed within a few hours, the silage may start to heat adversely affecting the animal's intake. With sheep only enterprises, this material would be wasted whilst with adult cattle particularly, much will be consumed without adverse health effects although animal performance is likely to be reduced.

Benefits of combining cattle and sheep on your enterprise

Cattle and sheep play an important role in the management of grasslands and landscapes in Wales. There are many benefits to retaining a mixture of cattle and sheep which should be considered when looking at enterprise restructuring on livestock farms:

- Mixed grazing systems result in a much higher utilisation of the pasture than sheep or cattle alone
- When grazing availability is sufficient, mixed grazing systems result in a 10% improvement in animal performance
- Cattle are less selective in their grazing – this removes biomass and dead vegetation and encourages new plant growth
- Cattle can digest low quality forage much better than sheep which helps to improve the utilisation of marginal land
- Sheep will graze pasture that is not normally grazed by cattle
- Sheep graze close to the ground and prefer more nutritious plants or leafy parts of the plant. This helps the sward remain productive and reduces need for topping
- Mixed grazing helps to reduce worm burdens reducing drench costs

Finally it must be remembered that with only one enterprise, risk is increased and generally if the financial returns from one enterprise is constrained the other could be more buoyant.

Further Information

For further information on any of the content in this booklet or on the work undertaken by HCC please contact HCC on tel: 01970 625050, email: info@hccmpw.org.uk or visit www.hccmpw.org.uk.