

Farmer summary: Clamp silage slippage

Report prepared for AHDB by Dr D. R. Davies, Silage Solutions Ltd April 2020



Background

Clamp silage slippage occurs when the ensiled forage, usually grass, slips. The slip can occur within days of completing silage harvest, at a later date while the clamp is still sealed and/or during feed-out when a good vertical, clean, feed-out face can therefore not be maintained. The portion of silage at the front of the clamp slips forward, often by a few metres, which leaves a gap further back in the silage mass. Often, the sheeting is stretched and/or torn, which allows air to enter and causes both secondary fermentation and aerobic spoilage.

This fermentation and spoilage causes reduced nutritive and hygienic quality of silage, increased silage dry matter (DM) losses and reduced palatability, therefore decreasing animals' dry matter intake (DMI) of the grass silage. On many farms, the slipped silage will remain in place until feed-out past the slip zone. Efforts to fix the clamp face can cause a second slippage and this process is repeated until the entirety of the clamp has been fed.

Silage production has changed considerably over the years. The key changes detailed below may contribute to the issue of clamp silage slippage.

- Self-propelled forage harvesters are producing most of the silage and these are more
 efficient at producing consistent, shorter chop. Sometimes, the extra time involved
 means there is a reluctance to remove knives from the forages, but it is important to
 adjust the chopping length to the longer lengths desirable to reduce clamp slippage
 risks with low %DM grass
- Leys grown for grass silage have changed; highly digestible perennial rye-grasses (PRG) are now dominant and species such as fescue, timothy and cocksfoot, which have a greater tendency for higher levels of neutral detergent fibre (NDF), are rarely or no longer included. Over the last 3–4 years, there has been a swing towards multicut silage systems. In this system, 4–5-week regrowths of PRG are being ensiled with 75% digestibility and, therefore, have low levels of NDF often below 45%. The NDF fraction contains very low levels of acid detergent fibre (ADF) and lignin, which makes excellent quality forage, but has poor structure. A hypothesis yet to be explored is whether or not improving structure helps to hold the forage in the silage clamp
- Clamps can now be filled much more quickly, but this tends to result in inconsistent consolidation. Tractors are also bigger, which should aid good consolidation by exerting a greater downward force; however, together, these two factors have resulted in overall less consistent consolidation. This is perhaps associated with the myth that greater layer depths can be consolidated as efficiently when harvesting trailers deliver more loads at one given time, but this is not the case. Best practice guidelines for consolidation should be adhered to at all times
- Many farms are still practicing the 'Dorset wedge' approach to filling a clamp, which aims to fill the back of the clamp at a steep angle so the silage could be sheeted down more rapidly. The remainder of the clamp would be filled at that angle over the succeeding days; sheeting each day as the next section was completed. The approach aims to reduce the surface area to volume ratio for the penetration of air into the clamp during filling over 2–5 days. The horsepower of modern machinery is much greater, allowing tractors to climb and to fill at a much steeper angle; however, while this is possible, it is not desirable
- Rakes for producing the harvested swath have increased in size, resulting in more surface area being brought into the final 'rowed-up' swath. Some rake almost immediately after mowing, which results in variability in DM content within the swath

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Aim of the project

The aim of the project was to investigate whether farmers might benefit from new advice during harvesting, clamp filling and feed-out, which could reduce the risks of silage slippage.

Key findings

- The higher and wider the silage clamp, the more this may increase the risk of silage slippage. With high, wide clamps, there is increased vertical weight and therefore increased force on the silage beneath at feed-out. There are also feweer frictional forces from the wall to hold the silage in the clamp
- Overconsolidation of grass silage with a %DM content less than 25% may exacerbate the problem of slippage
- On many farms, the main factor contributing to silage slippage is inconsistent density; for example, where lower regions of the silage in the clamp are of lower density than regions higher up. This acts like a poor foundation: the lower density silage beneath is less able to support the higher weight above it, so it collapses, causing slippage
- Poorer silage preservation occurs where there is lower density. Acetic acid production increases the production of the end products water and CO₂, which could increase the risk of slippage
- Filling the silage clamp at an angle greater than 20° can increase the risk of silage slippage
- High-quality silage is essential for modern livestock production; however, the improvements in silage quality may increase the risk of clamp slippage because there is less structural fibre. Rather than reducing silage quality to reduce the risks of clamp silage slippage, the other factors highlighted should be altered to solve the problem

Take-home messages

- This study found that the single most important factor affecting silage slippage was inconsistent consolidation within the silage clamp during filling. To overcome this, the silage-maker must:
 - Fill in layers of the same depth (>28% DM =15-cm thick layers, 25–28% DM = 20-cm thick layers and <25% DM = 25 cm thick layers)
 - o Consolidate to the same extent for each and every load
 - Adjust chop length if the %DM of the incoming crop changes. It is good practice to monitor the %DM content during the harvest period for each cut of silage. A how-to guide to the quick hand squeeze method highlighted is in the AHDB publication <u>Making grass silage for Better Returns</u>
- Consistent consolidation reduces variability in silage fermentation quality, thus reduces variation in CO₂ and water production and reduces the risk of shifts in the silage mass. At lower %DM content, there is more undesirable fermentation than in higher %DM silages, meaning there is an increased risk of slippage if inconsistent consolidation has occurred
- If the problem occurs every year, consider reducing the height of the silage ensiled within each silage clamp. This will lower downward pressure and reduce the risk of slippage

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 To reduce the risk of slippage, it remains important to continue following previous advice on increasing chop length for low DM silages to ensure the clamp is not filled too steeply

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