Actisaf®
Beef Presenter

yeastsolutions.co.uk

Phileo by Lesaffre

What is Actisaf®?

- Actisaf® is a **specific strain of live yeast** of the species Saccharomyces cerevisiae
- Yeast ferments carbohydrates, **respiring oxygen** and producing carbon dioxide
- An **Actisaf yeast prill is a bit like a Malteser** - the **unique drying process results in a layer of dead cells around the edge of the prill (like the chocolate on the Malteser!)** that protect the live cells within

Key factors for a live yeast to be effective:

- **Strain** - Actisaf is a specific strain selected for performance as a feed additive
- **Stability** - Actisaf has a unique drying process that gives excellent stability
- **Dose** - Yeast must be adminstered at the correct dose to get the optimum response

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About Phileo Lesaffre

- **Actisaf®** is produced by Phileo Lesaffre Animal Care, part of Lesaffre, the **world's largest manufacturer of yeast**
- Around **40% of the world's yeast** is made by Lesaffre!
- **Actisaf®** is produced by a **unique and patented fermentation process** in the production plant in Lille

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Digestion in the rumen

- The rumen is a **large fermentation chamber packed full of microbes**
- In a mature animal it has a capacity of around 120 litres - about the same as a wheelie bin!
- The rumen microbes digest feed to **make energy and protein available** to the animal
- Rumen microbes require a **low oxygen environment**, and **pH between 6.0-7.0**, to optimise feed digestion

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Digestion in the rumen - “feed the bugs first”

Cattle consume feed

Microbes digest feed

Microbes grow

Microbes produce energy in the form of Volatile Fatty Acids (VFA), which are absorbed through the rumen wall

Some microbes are washed out of the rumen and provide the majority of the cow’s protein requirements further down the digestive tract

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Maximising returns

- Plan to achieve **maximum weight gain per kg of feed**
- Highest feed efficiency is realised in **young animals** and declines with age
- Focus on **protein first to growing cattle** to grow frame and avoid small, over-fat animals
- Focus on **energy first in finishing diets** to hit target slaughter weight and conformation

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Common diet targets for growing & finishing cattle

Growing cattle diet targets (Continuous frame growth)			Finishing cattle diet targets (short sharp period of max DLWG)	
DMI	2.3% BW	- →	**DMI**	2% BW (Approx)
DLWG (KG)	0.7-1.3kg		**DLWG**	>1.4kg
DM	30-60%		**DM**	30-60%
CP	15-16%		**CP**	12-15%
Mj ME	10.5-11.4	+ →	**Mj ME**	>12.2
NDF	>40%	- →	**NDF**	>25% NDF
Fat	<3%		**Fat**	<6%
Starch & Sugars	>20%	+ →	**Starch & Sugars**	>33%
Calcium	0.80%		**Structural Fibre**	6-8%

33% starch and sugar, coupled with lower NDF, in finishing diets challenges rumen function and potentially promotes excessively acidic rumen conditions. NDF from forage is essential for an effective rumen mat and rumination, to maintain optimum rumen function

(EBLEX, 2013)

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Water - the forgotten nutrient

- Cattle require between **5-7 litres of water per kg dry matter** consumed
- The water content of feed is very variable
- Cattle will drink together so **water supply must cope with peak demand**
- All stock must have an **uninterrupted supply of fresh, clean and easily accessible water** at all times
- Water troughs should ideally be inspected daily and, if contaminated with straw or faeces, they should be **cleaned out**

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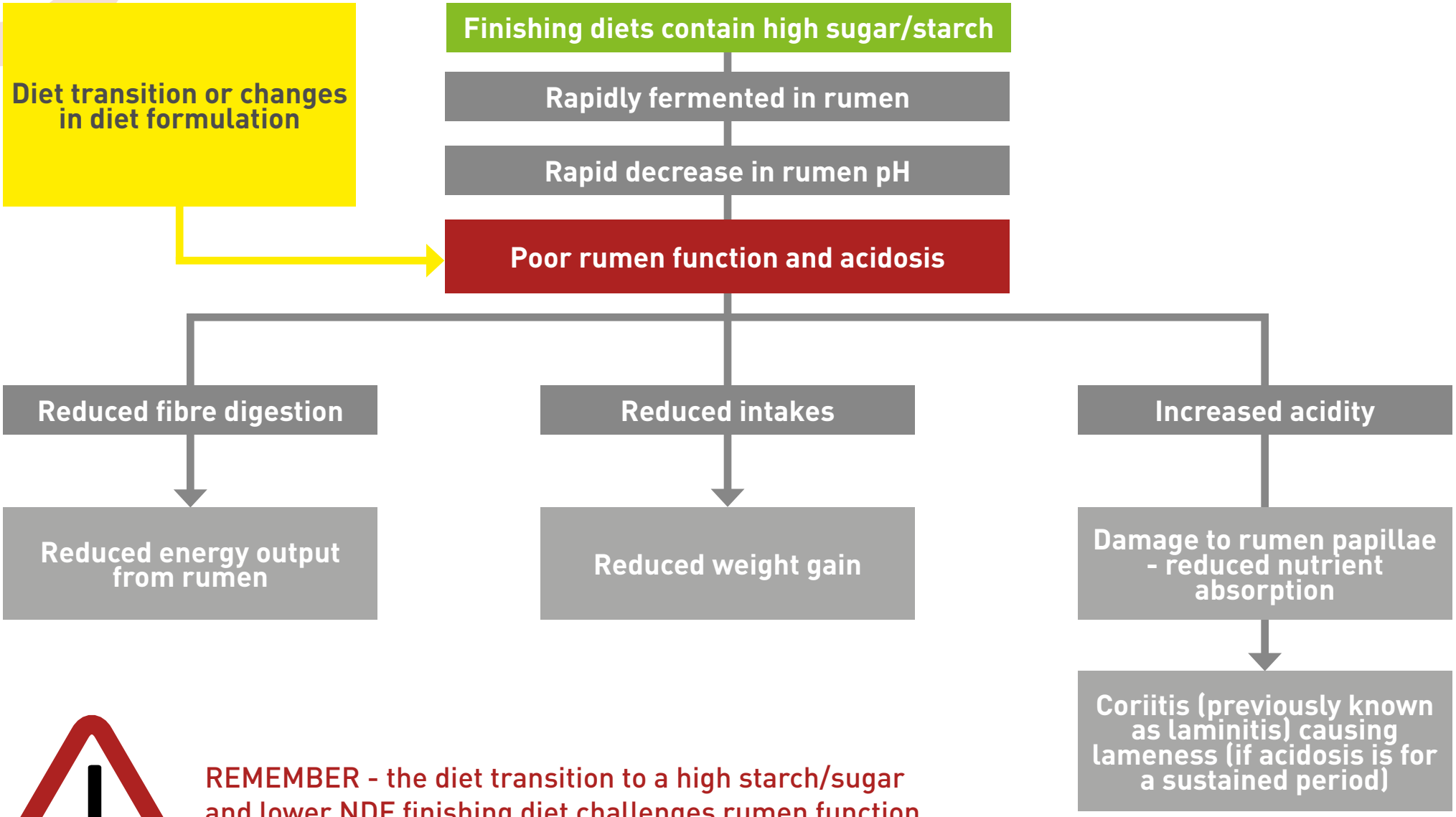
Challenges to rumen function



REMEMBER - the diet transition to a high starch/sugar and lower NDF finishing diet challenges rumen function

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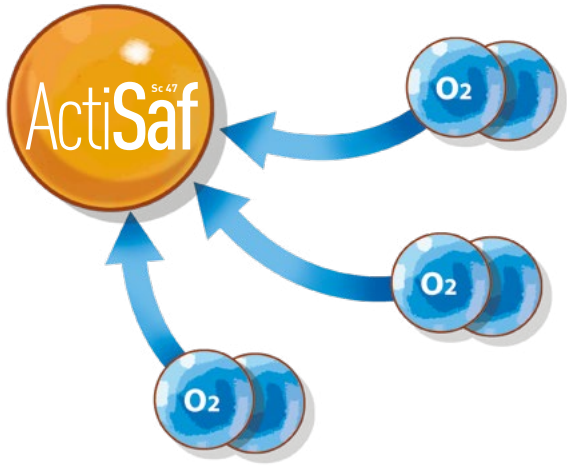
How does Actisaf® work in the rumen?

- The rumen is continually challenged by **oxygen, which is toxic to rumen bacteria**

- **Actisaf® uses up oxygen**, resulting in the **growth of fibre-digesting bacteria and lactate-utilising bacteria**, increasing feed digestion and **stabilising rumen pH, which prevents acidosis** from developing



- **Actisaf®** allows the microbes to **convert lactate to propionate**, a volatile fatty acid (VFA) that optimises growth rates, feed efficiency and lean meat production

- **Five grams of Actisaf® has been proven to have the equivalent buffering effect of 150 grams of sodium bicarbonate**, thereby stabilising rumen pH

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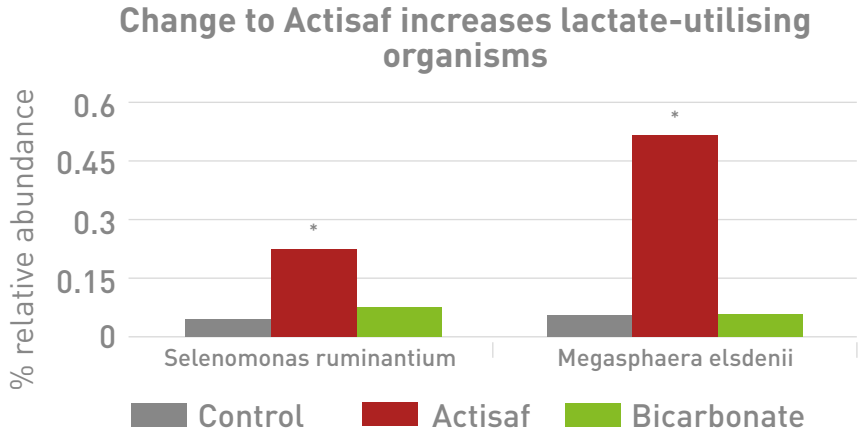
Supporting published trial work - Actisaf® vs Bicarbonate

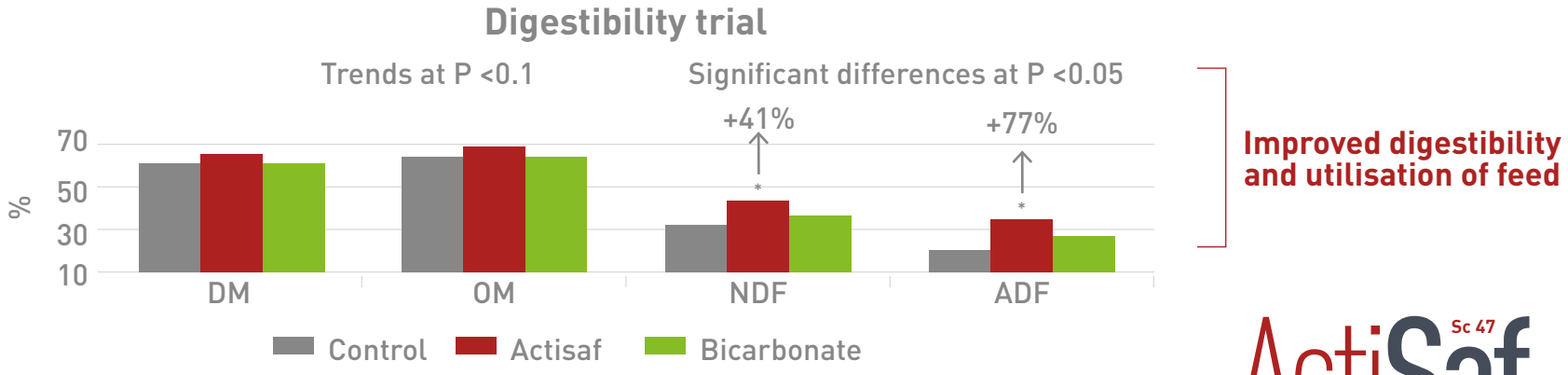
Fermentation parameters & fibre degradation

How does Actisaf live yeast differ from sodium bicarbonate in stabilising ruminal pH in high yielding dairy cows?

(mM)	Control	Actisaf*	Bicarbonate
Total VFA	85.3[a]	99.4[b]	95.3[b]
Acetate	53.2[a]	59.1[b]	60.8[b]
Propionate	18.0[a]	**25.8[a]**	20.0[a]
Butyrate	10.6	10.2	10.1
Lactate	16.5[b]	**5.4[a]**	12.2[b]

*Note Actisaf delivers an increase in proprionate, a key glucose precursor and the driver of high levels of weight gain and feed efficiency





Journal of Dairy Science (Marden et al., 2008).

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Supporting published trial work (2) - Ruminal pH profile and feeding behaviour on transition from high-forage to high-concentrate diet

Does the transition to a high-concentrate finishing diet have an impact on rumen pH and feeding behaviour?

80 cattle transitioned from store diet to a finishing diet over a 21 day period in 3 steps (+15% concentrate DM per week)

Impact on ruminal pH from transition to high-concentrate diet

Item	Step 1	Step 2	Step 3
Mean pH	6.26	6.11	5.81
Minimum	5.25	5.17	5.00
Duration under pH 5.8 (hr)	4.87	6.60	12.06
Duration under pH 5.5 (hr)	2.58	4.29	8.31

Trial demonstrated that following each diet step, mean daily ruminal pH declined and DM intake, meal size and meal duration were reduced. Duration of time when rumen was below pH 6.0 increased with higher concentrate diets and recovery time to baseline feeding increased with the severity of acidosis.

Canadian Journal of Dairy Science (Holthausen et al., 2013).

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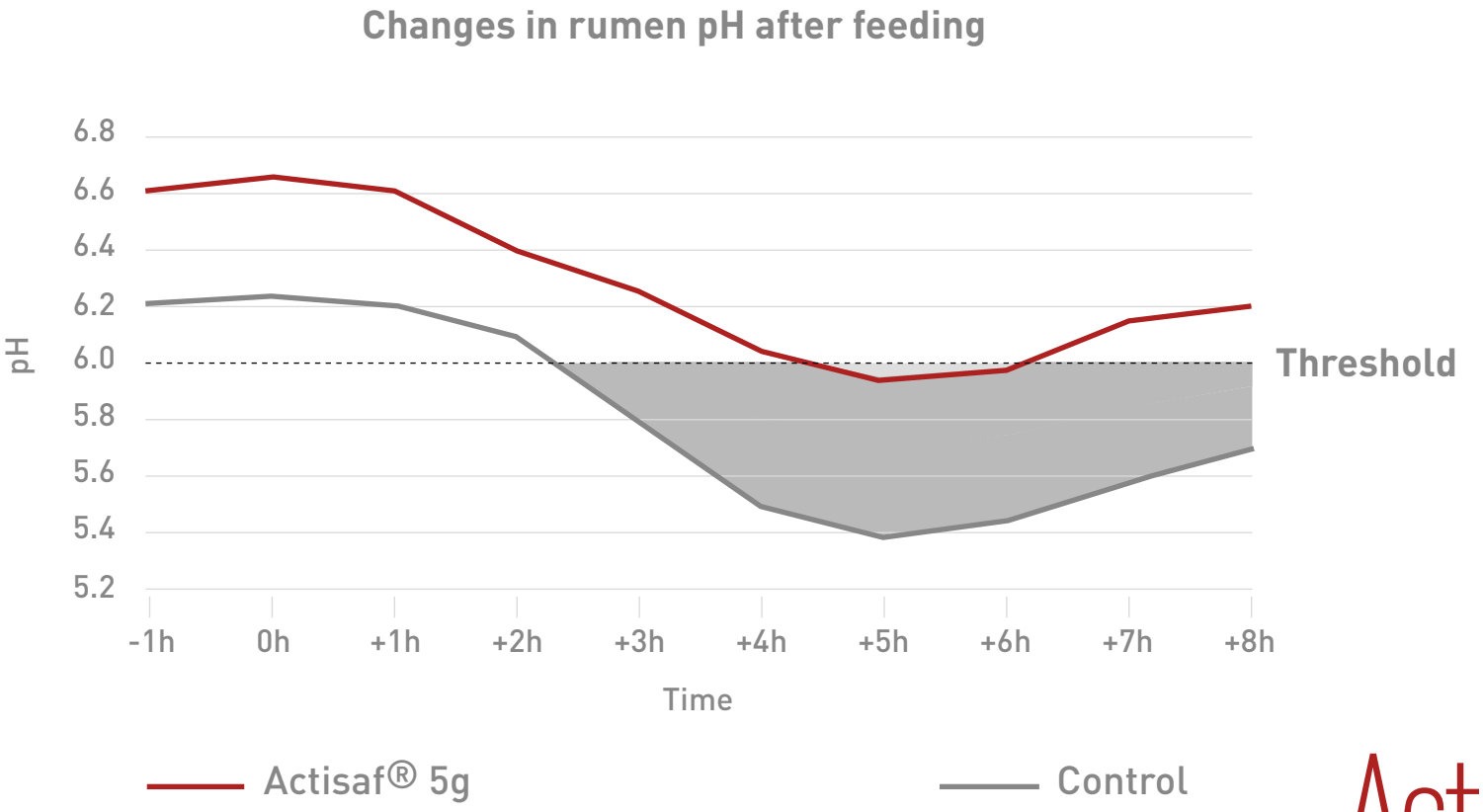
Actisaf stabilises rumen pH

Rumen pH drops after feeding. **Actisaf® stabilises rumen pH, thereby avoiding the negative impact of low pH on the rumen microbes** and associated negative health consequences:



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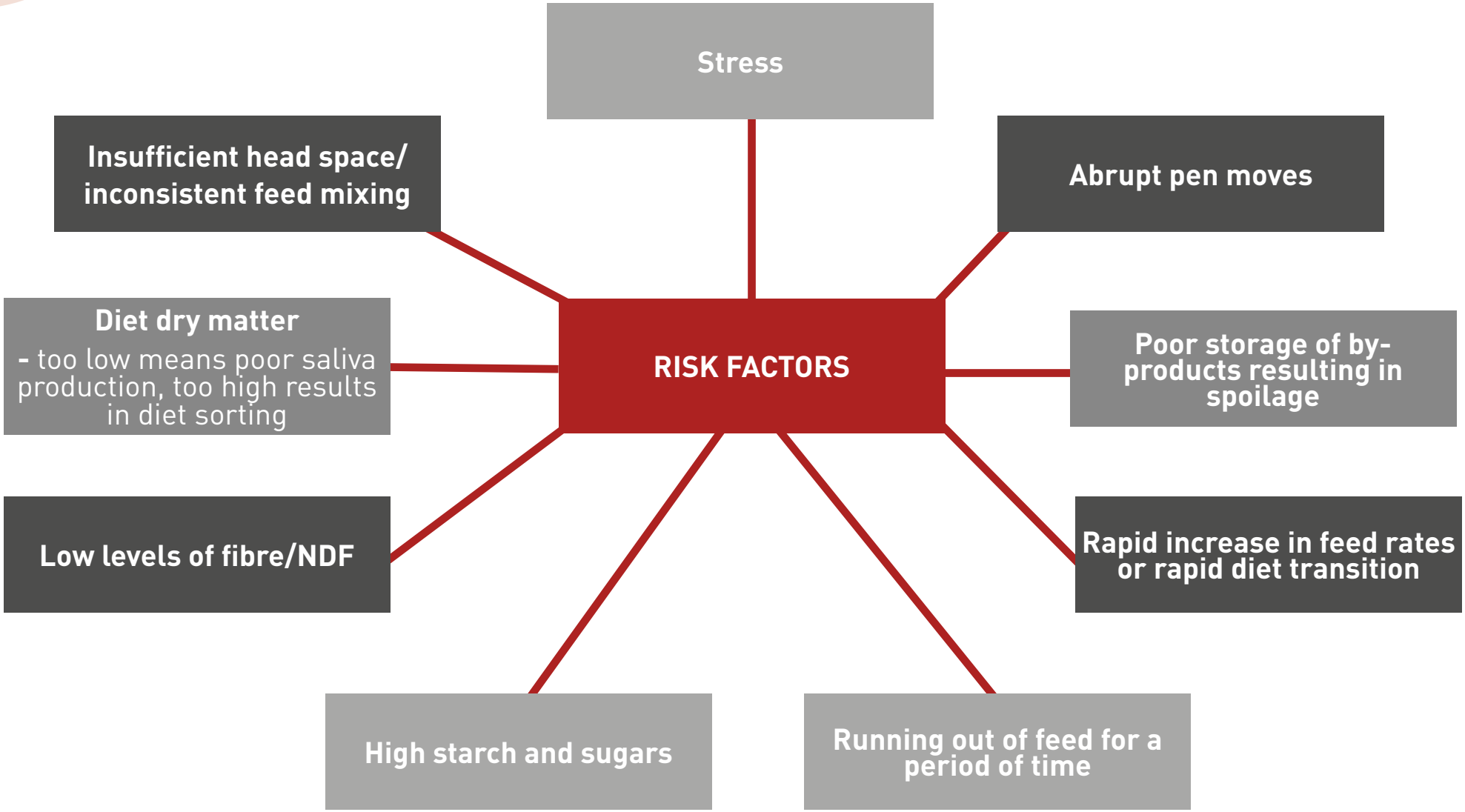
Risk factors for poor rumen function



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Warning signs

- Unexplained diarrhoea
- Loose dung
- Variable dung consistency (can indicate diet sorting)
- Soft, grey or foamy dung
- Mucin/fibrin casts in the dung
- Gas bubbles in dung
- Reduced feed intake
- Weight loss
- Lethargy
- Rapid breathing
- Poor ruminantion rates/cud chewing
- Poor feed digestion - undigested fibre/grains in dung
- Tail swishing in absence of flies

Acidosis damages rumen pappillae

Pappillae are finger-like projections in the rumen that are vital for nutrient absorption

Healthy pappillae

Damaged pappillae

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What are the benefits of Actisaf®?

Actisaf® creates a more favourable environment for the rumen microbes resulting in:

- **Improved digestibility and feed utilisation**
- **More stable rumen pH**
- **Improved carcass classification**
- **Less ‘stalling’ of cattle on diet change**
- **Up to 9% improvement in DLWG**
- **Up to 4.3% improvement in FCE**

Summary

- Focus - **maximum weight gain per kg of feed**, which is reliant on balanced nutrients, good management and **optimum rumen function**

- High starch and sugar diets and diet transition can cause **rumen acidosis**, limiting performance

- **Actisaf creates a more favourable environment for rumen microbes**, improving feed conversion efficiency, intake, daily liveweight gain and carcass classification

- **Feeding Actisaf delivers an average return on investment of €39 (£36) per animal**

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