

Mixer wagons – some observations

Findings from the “Sustainable dairy farm systems for profit” project

M5 Project Information Series - Studies on Mutdapilly Research Station and subtropical dairy farms 2001 to 2005

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Overview

Mixer wagons are appearing more frequently on dairy farms. Opinions are divided on their ownership; some farmers say they have been the best thing they have recently purchased, while other farmers would not consider purchasing one.

This note gives an overview of how a mixer wagon fits into a dairy system, observations by some of the M5 Farming system project companion farmers and some notes about mixer wagons on farms.

WHAT DOES A MIXING WAGON DO?

Quite simply it mixes a number of usually stored feeds together so the ration can be fed back to the herd on a feedpad, in a trough or along a fence line. When the nutritive value of each feed is known, a complete balanced ration can be formulated. As each mouthful the animal takes is balanced, the danger of slug feeding some feeds and over consumption of individual feeds is eliminated.

The stored feeds can be grouped by their nutritive content and/or origin, e.g. **fibre** – silage, hay and haylage; **protein** – soybean meal, cottonseed meal and canola meal or **by-products** – palm kernel extract, brewer’s grain and pineapple pulp. More recently, many other by-products have become available and they can be also classified or grouped as energy or protein feeds.

It is possible to use green chop in a mixer wagon, but it is not a common practice. The main reason green chop is not used is that it usually has a high water content so will add greatly to the volume of

material that has to be mixed and subsequently fed out. An exception is to use high quality forage like lucerne or ryegrass to minimise the wastage from trampling or to reduce the energy lost by walking the herd long distances if it was grazed.

Rations from a mixing wagon are described as:

TMR, a total mixed ration, when the herd receives 100% of its diet as the mix.

PMR, a partial mixed ration, when the mix only contributes a part of the daily ration and the herd also grazes. A PMR can be fed after milking or between milking during the day.



Contemplating a mixing wagon?

Most farmers who are thinking about a mixing wagon are most likely already feeding significant quantities of silage or by-products and see a wagon contributing positively to ration formulation and their general farming operation.

Under these circumstances, a mixing wagon and feeding a TMR or PMR could have the following benefits.

Benefits (continued)

- Improved milk production from a better-balanced and mixed ration.
- A reduction in (or reduced risk of) metabolic diseases like acidosis, grain engorgement etc.
- A decrease in feed wastage, particularly when compared with round bales fed in ring feeders or on the ground in the paddock.
- With a mixed ration, there is less opportunity for cows to sort, separate and reject ingredients.
- Improved labour efficiency if the old feedout system was labour demanding.

However adding a mixing wagon adds additional complexity and cost to the feed system.

- Obviously, there is the cost of the mixing wagon, but there may be additional costs for other equipment and storage facilities.
- There is a need to formulate the mix. This can be done by a nutrition consultant or is a skill that must be learnt by the farmer.
- By feeding in a confined area there is potential for manure and nutrient build up, issues to consider are effluent run off and the value of manure as fertiliser.

A partial budget would be useful

Adding a mixing wagon to your enterprise will change your costs and returns. To evaluate this change a partial budget should be done.

The budget should estimate

- a) Added capital required.
- b) Additional returns from increased milk and reduced wastage.
- c) Added costs associated with using a mixer wagon.

a) Added capital could include

- Feed mill.
- Mixer wagon with scales
- Front-end loader.
- Commodity shed or bays for storing bulk quantities of feed.
- Additional feed bunkers.
- Additional fencing, feed and water troughs.
- Effluent management.

b) Additional returns could include

- Increase in cow and herd production, 3-25%.
- Increase in milk fat percentage.
- Reduced feed wastage, 3-15%, more if round bales have been used.
- Other returns from sale of old equipment.

c) Added costs could include

- Added feed cost, extra milk requires more feed.
- Added labour costs.
- Fuel and R&M for tractors and mixer wagon.
- Financial costs of additional machinery, interest or lease fees plus residual payments.
- Nutrition consultant fees, feed analyses and computer programs.

Profit or loss = totals of returns **b)** minus costs **c)**

M5 COMPANION FARMER DISCUSSION

At a M5 companion farmer workshop, a panel discussion was organised to discuss the issue of incorporating a mixer wagon into the farm feed program. Three farmers gave their experiences and then a question and answer session followed. Following are three brief case studies on farmer views and experiences with mixer wagons.

Case study 1 – YES to a mixer wagon

Farmer 1 has a herd of 140 cows and bought a mixer wagon 5 years ago. It can process hay. They estimate they have saved three bales a day from wastage since using the mixer wagon.

The wagon has been used more during the last few years with increased levels of supplementary feeding. It is great in wet weather. They have identified better herd management as a result and the cows are content. Now the forage is fed on the ground, however they would like to move to a trough. The grain is fed in the dairy rather than the PMR, and they are content to keep doing this. The minerals are fed in the PMR.

Milk production has increased since using the mixer wagon. Because the farm layout is complex, the mixer wagon has reduced the amount of walking the cows do, saving a lot of energy.

Case study 2 – NO to a mixer wagon

Farmer 2 milks 200 cows with an ambition to never own a mixer wagon. He believes it is an expensive item, and he believes he has never known an operation to run satisfactorily with a mixer wagon over a long period with existing milk production and pricing.

Costing \$70,000 and replaced every 3 years, farmer 2 states they are too expensive, and there is not enough profit from their use. Getting a wagon is related to herd size and milk price. “If we get to a point where we rely on a mixer wagon then we are doomed to extinction”.

This farming system feeds 3 to 4 tonnes of silage per cow per year. Currently during the dry seasons they operate a manual mixing system using a bobcat and attempt to spread the silage, WCS is put in bucket loads in 3 or 4 spots along the pad but they are hopeful to return to paddock feeding as soon as possible.

When pastures are growing with good irrigation, they probably have 3 to 4 months each year on a feed pad. This was also highlighted as a discussion point. Is it cost effective to spend money on a wagon for limited use.

This is a flat farm, with good water and good soil. It should not need a mixer wagon. The farm can produce milk for 18c/L (variable cost), if they go to a PMR, the variable costs would increase by 6 c/L to 24 c/L.

Case study 3 – YES to a mixer wagon

Farmer 3 milks 320 cows and bought a second hand mixer wagon about 7 years ago and more recently bought a new wagon.

He originally bought the mixer wagon because he had no irrigation water and with the drought, he had to buy in a lot of poor quality forage. With a mixer wagon he could mix this forage with better quality silage, molasses and minerals to get a mix that the herd would eat with minimum wastage.

With the wagon, he believes he can better manage a large herd with a reliable year round feed supply. 2003-2004 was the first year he had used the

wagon all year round, the herd produced an extra 200,000 L and it was his best year financially.

To minimise wastage a gravel feedpad was constructed, there is no shade over the feedpad.

ADDITIONAL DATA FROM A SURVEY OF 10 FARMERS SEVERAL YEARS AGO

Reasons given for buying a mixing wagon

- Wanted to increase farm production.
- Wanted to increase stocking rate.
- Wanted to lift protein percentage.
- Seen as a way of expanding the dairy operation as no other suitable land was available close to the existing operation.
- To manage drought and flood feeding.
- Property shape, cows now walk less.
- To enable safer by-product feeding.
- To reduce forage waste.
- It is a better way to feed round bales.
- The old box had to be replaced.

Would you do it differently, all said yes

- Irrigation is the number 1 investment if feasible.
- Need by-products to make them pay.
- Would have purchased a bigger machine.
- Would have done more homework on the types of machines.
- Should have sought out cheap feeds.

What were the production responses

- Milk production, 10 said yes.
- Butterfat percent, 9 said yes with 5 saying between 0.2 and 0.5%.
- Protein percent, only 4 recorded an increase. In more recent times the emphasis on feeding more starch in the herd diet has produced an increase in both % and kgs of protein.
- Conception rate, no results identified in the short term.

Time taken to cover repayments

- Six had no opinion.
- One said covered them OK.
- One said took about 3 months to get production response.
- One saved \$30/tonne on grain; wagon has a roller mill on it.
- One noted immediate production response.

Advice to a new person

- Initially there is the temptation to buy a smaller wagon but herds expand over time and some by products are bulky. It is cost effective to mix one large load rather than 1½ small loads.
- Consider what happens in wet weather and the slopes required to be negotiated.
- If more than ⅔ full it may not mix properly.
- Be prepared to pay more attention to detail when you have a wagon, ration formulation, contract purchase of feed etc.

Tractor requirements

- Over 100 cows need 14 cubic meter capacity.
- Think about safety, a full bin weights 7-10 tonnes.
- 4WD tractor required.
- Using round bales needs more power.
- Most feed wagons mix feed adequately with a 60 HP tractor, but for safety in operation a 80 plus HP tractor is required.

Future farm in 10 years

- Moved from a low to a high input system.
- North American influence – balanced and formulated rations, controlling heat stress, PPC increases, computers, lease land, by-products, genetics, systems research.
- Payment on milk quality and bonuses for “new” milk.

Question clients want answers to

- How much will a PMR increase milk production?
- What are the BF % and protein % responses?
- Need information on benefits of splitting the herd.
- Will I save feed?
- How to feed long hay in a PMR?
- Herd health – are there any benefits?
- What investment is required in other facilities?
- What size of mixer should be used?
- What are the real costs?

Advantages seen

- Better control – knowing the weights of individual feeds and a nutritive analysis of these feeds the diet can be balanced.
- Milk production is limited by DM intake, so increasing the DM intake has a positive effect.
- Feed preferences are reduced and slug feeding reduced or eliminated. Fewer digestive upsets.
- Flexibility in rations, rations can be made palatable by inclusion of molasses and some by-products.
- Adapts well to computer ration formulation.
- Labour becomes more specialised and benefits follow from more attention to detail.

The verdict on production changes

Effect on	The effect has been
Milk yield	Yield per cow increases
Protein %	Variable response, as many increases as decreases in protein %
Milk fat %	Generally show an increase, but not always

Look at financial aspects

- How to finance – could use traditional principal and interest loans or chattel mortgages. These loans should be tailored to the effective life of the machine.
- Consider terms and conditions.
- Realistically assess the income stream.
- Consider the assets/equity position.

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Whole farm management and modelling

The *Sustainable Dairy Farm Systems for Profit* project at Mutdapilly Research Station and on associated commercial farms investigated the potential impact of intensification of five subtropical dairy farming systems on business productivity, on the social well being of farming families and on the farm environment.

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