



Harper Adams
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Making More From What You Grow

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Feed Science Forums –
Coordinated by BSAS and RABDF



More than Forage?

- The Size of the Challenge
- Broad Issues
- Costings Distortion of Value
- What the Animal Needs
- **2010/11 Trial Harper Adams**
- Conclusion

Having heard my introduction how much more milk / beef do you, realistically, think you could produce from home grown feeds in the future?

1. 0 to 10%
2. 11 to 20%
3. 21 - 30%
4. > 30%

“Cows can not live by Forage alone”

Take Two Diets

Diet name:	Diet 1	Diet 2
<u>Animal details</u>		
Milk Yield (kg)	32.0	32.0
Milk fat (g/100g):	4.2	4.2
Milk protein (g/100g):	3.2	3.2
<u>Feeding plan (kg as fed/head/d)</u>		
Grass Silage (Plus)	-	24.000
Grass Silage Standard	20.000	-
Maize Silage (Plus)	-	24.000
Maize Silage Standard	20.000	-
Straw -Wheat	0.500	0.500
Megalac	0.300	0.300
Molasses Blend 80/20 (PNP)	2.000	2.000
K General Mineral (150)	0.150	0.150
Limestone	0.100	0.100
Dairy Event Energy	4.000	2.500
Dairy Event Protein	4.000	3.000
<u>Nutrients</u>		
DM intake (kg/d)	20.3	20.4
Forage DM (%DM)	11.2	13.5
ME (M/D)	12.1	12.1

2.3 kg Dry Matter = 2.75kg of Own Grown Cereals

Sugar (%DM)	8.0	7.0
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Forage Stocks Required For 100 Cows:-

•Diet 1 Forage Stocks

- 400 tonnes Grass Silage
- 400 tonnes Maize Silage

•Diet 2 Forage Stocks

- 480 tonnes Grass Silage
- 480 tonnes Maize Silage

Forage Quality Required:-

•Diet 1

- Grass Silage 11.2 ME, 14% Protein.
- Maize Silage 11.5 ME, 27.5% Starch

•Diet 2

- Grass Silage 11.7 ME, 17% Protein.
- Maize Silage 11.7 ME, 30% Starch.

The Costings Factor

<u>Published Results June 11</u>		<u>Cereals At Market</u>		<u>Cereals At Cash Cost</u>	
Cows	175	Cows	175	Cows	175
Yield	8000	Yield	8000	Yield	8000
Milk Income	£2100	Milk Income	£2100	Milk Income	£2100
Purchased Feed	2600kg	Purchased Feed	1600kg	Purchased Feed	2600kg
Cost	£202/t	Cost	£202/t	Cost	£202/t
		Home Cereal	1000kg	Home Cereal	1000kg
		Cost	£175/t	Cost	£125
Total Cost	£525	Total Cost	£498	Total Cost	£478
Margin	£1575	Margin	£1602	Margin	£1652
		Difference	£4725	Difference	£13,475

Lost Cash Crop Margin on Forage Land = £160/Cow?

What Does The Cow Need?

- Environment
- Forage & Feed Quality
- Nutritionally Balanced Diet
- Correct Diet Presentation
- Functioning Rumen
 - Forages Affect Rumen Function
 - Forage Acidity Affects Rumen Function
 - Excess Starch Affects Rumen Function
- Alkasytem & Alkagrain



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Harper Adams Beef Trial

*“The Ultimate test of rumen function
and acid loading”*

With Thanks to

Mr Simon Marsh

Harper Adams University College

Objectives

- Objectives of Trial:-
 - To test the performance of Alkagrain against Conventional Feeds in extreme rumen challenge.
 - To maximise the use of cereals in the diet.
 - To consider the outcome relative to both cost and cash input into beef finishing
 - Can the diet make more of what we grow?

Trial Design

Set Up:-

- Holstein x bulls 300kg
- Hopper Fed
- Bed on Straw
- Plenty Water
- Diets both 14% Protein and 12.9 MJ /kgDM MER
- Alkagrain –
 - 94.6% Barley, 3% Hn'D, 2.4% Min.
- Control –
 - 77.5% Barley, 7.5% Rape, 7.5% Soya, 5% Molasses, 2.5% Minerals.



Results

Results No Significant Difference

- DLWG – Control 1.32kg, Alkagrain 1.31kg.
- Slaughter Weight 560kg
- Kill Out 51%
- Confirmation 2.2 (O+, few R)
- Fat Class 2.9

Results With Significant Difference

- Feed Intake Control 9kg, Alkagrain 8.3kg.
- Feed Efficiency Control 6.82, Alkagrain 6.34
- Feed Cost Control 116p/kg, Alkagrain 107p/kg.
- **Purchased Feed Cost Control 32.8p/kg, Alkagrain 14.1p/kg. = £48.62 /head**

Liver Scoring



Liver Score 1.80 Control vs 1.25 Alkagrain

Trial Conclusions

- Alkagrain Technology allowed greater use of own grown feed.
- Intensive Finished Bulls are an Extreme Test of Technology Designed to Improve Rumen Function.
- Improved Rumen Function Reduced Liver and Metabolic Stress and Increased Feed Efficiency.

Application to Dairy Feeding?

FEEDING

Treated wheat slashes feed cost and reduces acid loading

Staffordshire dairy farmer James Brown has tried many ways of making more use of home-grown feeds, but last year hit upon a solution he says represents the cheapest source of protein he has yet to find. **Ann Hardy** reports.

James Brown claims he has wiped an incredible £27,000 from his total feed bill and benefited from improved cow health and increased milk production.

He says the system he has used which involves the alkaline preservation of home-grown wheat straight from the combine is a technique he will be sticking with and involves the controlled release of ammonia into the crop using a pellet based on soya and urea.

With 630 acres of arable and grass, James and his family's tenanted Lower Barton Farm, in Bradley, near Stafford, has always grown a good crop of wheat. Ventures into maize growing on the farm's heavy land have invariably proved a disappointment, and its autumn harvest has often led to soil damage and made the crop difficult to follow.

"We have been growing wheat for years and we know year on year exactly what we are dealing with," says James, who is a long-term user of 'alkalage' made from whole crop wheat.

So when he heard that the

same soya/urea-based ammonia release pellets used to make alkalage were being successfully used to preserve the wheat grain alone, he was eager to give it a go.

Aware that the 'alkagrain' which results from the process could potentially form an important concentrate element in his herd's total mixed ration and replace some bought-in components, he found his way around the difficulties he envisaged.

Concerned

"I was worried to start with," he admits. "I was concerned if we had a wet harvest, I would not be able to stack the wheat sufficiently deep, and it was also important that we didn't hold up the contractor.

"Alkagrain has to be crimped, so the question was whether to crimp it straight off the field and risk a bottleneck, or whether to store it whole, adding the ammonia release pellets to the grain and crimping it later."

Eventually opting to crimp as the grain came in from the field to save double handling, he says



Early alkagrain user James Brown (right) with Malcolm Graham from FiveF, who promotes alkasystems.

that by dedicating two staff to the job, there was no bottleneck. One-tonne telehandler buckets are scooped up and one-and-a-half bags of pellets are spread across each load and the mix then put through the crimper before being clamped and covered.

"We made 100 acres-worth of alkagrain and a similar quantity of alkalage, harvesting both at the same stage of maturity and

around 18-19% moisture, in the middle of August," says James.

With the aim of starting to feed it at the earliest opportunity, by September the 325-stong milking herd's newly formulated ration for maintenance plus 30 litres comprised 10kg alkalage, 14kg grass silage, 4kg alkagrain, 3.5kg of a bought-in blend and some lactose from liquid whey as a source of sugar (as high starch cereals are always low in sugars).

"Before we brought in the alkagrain, we were feeding 7kg of blend compared with the 3.5kg we're feeding now," says James. "We're getting this at £275/tonne, and I've worked out that this year's alkagrain will cost me £160/tonne – that's including all growing costs, crimping and the pellets.

"Even allowing for other small adjustments to the ration as it is fine-tuned to complement the new ingredients, this is saving me at least £90/tonne, which at 300 tonnes represents £27,000 a year," he says.

However, other features of the product have further appeal, not least the protein advantage

Treatment and protein balancing costs of alkagrain and other grain processing options (Based on 10.9 t/ha wheat crop)

	Alkagrain	Combined grain	Crimped grain	Caustic soda-treated grain
Fresh yield (t/ha)	10.9	10.9	14.1	10.9
DM yield (t/ha)	9.1	9.1	9.1	9.1
Combining cost (£/ha)	75	75	75	75
Crimping cost inc additive (£/ha)	136	0	246	0
Drying cost (£/ha)	0	158	0	0
Ammonia release pellet cost (£/ha) (1)	216	0	0	0
Caustic soda cost (£/ha) (2)	0	0	0	212
Grain milling cost (£/ha)	0	109	0	0
Diet feeder cost (£/ha)	0	0	0	70
Total cost before protein balancer (£/ha)	427	342	321	357
Protein balancer (£/ha) (3)	0	474	373	474
Total weight of DM fed (t/ha)	9.1	10.8	10.5	10.8
Cost differential tonne DM fed (£)	£46.92	£75.55	£66.10	£76.84

1 = 30kg per tonne @ £660/tonne. 2 = Caustic soda @ £650/tonne. 3 = Need to add a 50:50 mix of HiPro Soya and Rape @ £250/tonne to give 16% protein meal equivalent.

Dairy Farmer July 2011

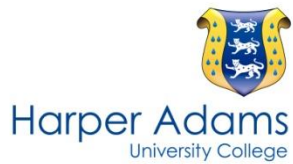
- Integrated Grass / Red Clover & Wheat.
- Stopped Growing Maize
- Combination Alkalage & Alkagrain.
- Feed the equivalent of 10kg per cow per day of own grown wheat.
- Reduced Purchased Feed by over 4kg per day.
- **Saving £27,000** on a cost of production basis.

Concluding Points

- Making more from what you grow improves profit potential, utilisation of nutrients and environmental impact.
- Many farms can improve utilisation of grazing and conserved forages. BUT there is significant potential in farm grown concentrates particularly cereals.
- New technology allows substantial increases in the use of own grown cereal crops through improved rumen function and enhanced feed efficiency.
- Small grain cereals can be reliably grown across the whole UK.

Having listened to the whole presentation how much more milk / beef do you now think you could produce from home grown feeds in the future?

1. 0 to 10%
2. 11 to 20%
3. 21 to 30%
4. > 30%



Thank You



- Simon Marsh - Harper Adams University College.
- Kingshay, Promar & Dairy Co – Published Costings Data
- Dairy Farmer Magazine – Anne Hardy Journalist – James Brown Farm Story

www.fiveflp.com

