



# Sprouted Barley For Dairy Cows:

## Is It Worth It?



### Sprouted grains for dairy cows

- Old technology with renewed interest
- Potential for continuous production of fresh forage all year
- Viewed by some as 'easier' alternative to growing high-quality forages

Our objective was to evaluate the feasibility, effectiveness and challenges of implementing sprouted barley fodder systems on grazing dairy farms.



Left to right: barley grain, barley after 3 days of sprouting, barley after 7 days of sprouting (last 2 pictures).

### Unanswered questions

- Effects of sprouted barley on milk yield, milk composition and economics
- No data about feeding value of sprouted barley with high-quality pasture and conserved forages

### What Did We Do?

- **Sprouting Study:** Five grains (barley, oats, wheat, rye, and triticale) were sprouted for 7 days in a fodder system and analyzed for yield and nutritional content (Univ. of MN)
- **Cow Study:** Lactating dairy cows were fed a TMR (during the winter) containing either: 1) no fodder; or 2) 3 lb DM/cow/d sprouted barley fodder. Milk production, milk composition and income over feed costs (IOFC) were evaluated. (Univ. of MN)
- **On-farm Case Study:** Three organic dairies that fed fodder were monitored monthly for 12 months to collect data on feed nutritional analysis, milk production/composition and management information. (USDA-ARS)



# RESULTS

## Sprouting Study

- Barley and oats had greatest **fresh weight**
- Oats had greatest **DM yield**
- Barley and wheat had the highest **protein %**
- Barley had lowest **mold score**

## Cow Study

- **DM intake** and **milk protein %** lower in cows fed fodder
- **Milk yield** and **milk fat %** similar with or without fodder
- Cows fed fodder had higher **milk urea nitrogen**, suggesting **less efficient use of feed protein**
- IOFC favored **NOT** feeding fodder except when organic corn prices increased by 50%

## On-farm Case Study

- Two farms **discontinued feeding fodder** during the study, due to **labor, cost of production, barley supply and mold issues**
- **No milk response** was noted in 2 of the farms. Both farms produced **high-quality forages** which were more economical to feed and produced a better milk response
- One farm was small (20 cows) & used a low-input, home made system. **Home-grown forage quality was marginal**, therefore fodder may have provided better nutrition and better milk response

**Sprouting study:** Mean numerical nutritive quality and biomass production of five different grains used for fodder production at the University of Minnesota.

Nutrient	Barley	Oats	Rye	Triticale	Wheat
DM, %	89.9	91.9	88.7	89.2	88.7
CP, % DM	14.1	13.0	11.1	13.9	14.8
NDF, % DM	26.9	29.7	22.2	17.7	10.3
NE <sub>L</sub> , Mcal/lb	0.75	0.78	0.78	0.78	0.82
Yield					
Weight, fresh lb	20.5 <sup>a</sup>	20.0 <sup>a</sup>	17.2 <sup>b</sup>	13.9 <sup>c</sup>	19.4 <sup>b</sup>
DM, %	15.4 <sup>a</sup>	19.1 <sup>b,d</sup>	19.8 <sup>b</sup>	24.2 <sup>c</sup>	18.9 <sup>d</sup>
DM yield, lb	3.3 <sup>c</sup>	3.7 <sup>a</sup>	3.5 <sup>b</sup>	3.3 <sup>c</sup>	3.7 <sup>a</sup>
Mold score (1= no mold; 6 = severe)	0.04 <sup>a</sup>	0.03 <sup>a</sup>	2.8 <sup>b</sup>	4.8 <sup>c</sup>	1.1 <sup>d</sup>

DM = dry matter; CP = crude protein, NDF = neutral detergent fiber; NE<sub>L</sub> = net energy for lactation.

**Cow study:** Milk yield, milk composition and income over feed costs (IOFC) in lactating cows fed barley fodder at the University of Minnesota.

Nutrient	No Fodder	Fodder
Dry matter intake, lb/d	38.5 <sup>a</sup>	31.9 <sup>b</sup>
Milk yield, lb/d	29.3	27.1
Milk fat, %	3.8	3.7
Milk fat, lb/d	1.1	1.0
Milk protein, %	3.0	3.0
Milk protein, lb/d	0.9 <sup>a</sup>	0.8 <sup>b</sup>
Somatic Cell Score	3.5	3.6
Milk Urea Nitrogen, mg/dl	13.5 <sup>a</sup>	16.5 <sup>b</sup>
IOFC (organic corn)	0.04 <sup>a</sup>	0.03 <sup>a</sup>
Current price (\$11.77/bu)	\$3.18	\$2.96
25% higher corn price	\$2.79	\$2.86
50% higher corn price	\$2.33	\$2.77



## CONCLUSIONS

Fodder systems may be a **costly method** of producing feed for dairy producers. However, fodder may have application in **small-scale operations**, farms with **high land values** where tillable acreage can produce high-value crops, or for producers experiencing severe, extended **drought**. Additionally, farms that have an **excess of labor** may benefit from a fodder system. Each farm must put **pencil to paper** to determine if implementing fodder in feeding management is economical, making sure to include **ALL** costs in deciding whether the money could be better spent growing or purchasing **higher-quality forage**.

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