

# INOCULANTS



## Silage Inoculants

**ENSURE®** for haylage; **ENHANCE®** for corn silage.

**Using inoculant means:** less dry matter loss, more rapid and effective fermentation, improved feed conversion, higher milk production and more weight gain.

FEATURES	BENEFITS
Rapid pH drop	Higher dry matter (DM) recovery (up to 6%)
Extends aerobic stability and bunk life	Improved forage quality, less wasted forage, less spoilage
Enhance contains two strains of <i>Lactobacillus plantarum</i> (PA28 & K270)	Highly efficient silage fermentation and extended bunk life
Ensure WS contains LP-1 <i>L. plantarum</i> and PC-3 <i>Pediococcus cerevisiae</i>	Highly efficient fermentation, converts glucose to lactose for less DM loss
Inhibits five major spoilage organisms	Improved forage quality, less wasted forage
Natural, safe, non-corrosive	Convenient to use and store
Research proven - many producer field and harvest and storage trials	Proven performance
Less heating of silage	More dry matter preserved, less shrink, less bound protein
Improved palatability	Less rejected silage, maximizes intake and production
18 month shelf life	Ensures product efficacy

\*In trials, dairy cows ate more inoculated silage and produced 1.5 to 4.8 pounds more milk per day.

**University research proves that preserving silage nutrients can be optimized by using inoculants like Ensure for haylage and Enhance for corn silage.**

### You Will See Improvements In:

**Dry matter recovery:** Save 5.8% by reducing dry matter losses. These losses represent protein, sugars and starches, the portion of the feed that is easiest to digest. The losses will need to be replaced with more expensive feed purchases, such as soybean and grain corn.

UNIVERSITY OF GUELPH INOCULANT STUDY – DEMONSTRATES THE VALUE OF USING INOCULANT			
	Untreated	Inoculant	Advantage
Moisture (%) / Dry Matter (%)	62.1% / 37.9%	59.5% / 40.5%	
Dry Matter Loss (%)	15.4%	9.6%	+ 5.8%
Forage Dry Matter Intake (lbs)	27.1 lbs	31.0 lbs	+ 3.85 lbs
4% Milk / Cow /Day	34.25 lbs	36.75 lbs	+ 2.50 lbs
Pounds of Milk / Ton of Forage Ensiled	809 lbs	868 lbs	+ 59 lbs
Grain As Fed/ Cow / Day (lbs)	12.4	13.2	
Milk Income / Ton of Forage Ensiled (TFE)924.45/ kg of milk)	\$165.12	\$177.14	
Grain Cost/ TFE @ (\$250/ton)	-\$36.61	-\$38.97	
Silage Cost / TFE (@ \$40/ton)	-\$40.00	-\$40.00	
Inoculant Cost / TFE (@ \$1.60/ton)	\$0.00	-\$1.60	
Net Return per Ton of Forage Ensiled	\$88.51	\$96.57	\$8.06/ton

## Research Shows a Significant Return on Investment with Silage Inoculants:

**Dairy Production:** This trial shows that a 50-cow herd dairy producer can potentially earn an additional net income of more than **\$ 8,743 per year** by using a silage inoculant.

ADDITIONAL INCOME WITH AN INOCULANT:	
Inoculated Silage: Milk Value/Cow/Day*	\$ 15.34
Untreated Silage: Milk Value/Cow/Day	\$ 14.82
Extra Income/Cow/Day	\$ 0.52
Extra Income/Day for 50-cow herd	\$ 26.00
Days per Year	x 365
Extra Income/Year	\$ 9,490.00
Estimated cost of Inoculant**	\$ -746.50
<b>Net Additional Income</b>	<b>\$ 8,743.50</b>

\* Based on average milk price of \$55.00/hectolitre. And average milk fat of 3.67%  
 \*\* Cost of inoculant may vary. Estimated cost in this example is based on 22.7 kg (50 lb.) of silage consumed/cow/day and inoculant cost of \$1.80/tonne of silage.  
 Source: University of Wisconsin

**Beef Production:** Steers gained **3.6 kg (7.9 lb.) more weight** per ton of inoculated silage consumed than steers consuming untreated silage.

## Quality Forage Starts with Good Management

**Moisture:** Too dry and the silage doesn't pack well and is more subject to yeast and mold infection, heating, dry matter loss and loss of water-soluble carbohydrates.

Forage that is ensiled too wet can result in runoff and excessive spoilage.

**Maturity:** Plant maturity at harvest is the most important factor in determining feed value. Maturity affects both yield and quality of the silage. (See page below on moisture and maturity)

### RECOMMENDED MOISTURE AND MATURITY AT TIME OF ENSILING

CROP	MOISTURE (%)			MATURITY	
	Upright Conventional	Oxygen-Limiting Silo	Bunker or Trench	Silo Bag	
Alfalfa	50-65	40-60	60-70	50-70	Mid-bud to early bloom
Alfalfa-grass Mixtures	55-65	45-60	60-70	55-65	Mid-bud to early bloom for alfalfa boot for grasses
Corn Silage	60-70	40-60	65-72	60-70	Milk line 1/2 to 2/3 down the Kernel
Small Grains	65-70	55-70	70-75	65-70	Boot to dough
Sorghum, whole Plant	60-70	40-65	5-70	60-70	Late milk to late dough for grain when leaves begin losing colour for forage

**Weather:** Conditions during harvest are a major concern for alfalfa but less of a concern for corn. The longer the wilting process, the higher the dry matter losses. This is due to undesirable microorganisms utilizing plant sugars, which could otherwise be used by beneficial lactic acid bacteria. Alfalfa that is too dry heats in the silo and has lower digestibility.

Product	Package	Silage Treated with 1 Unit
ENSURE® water soluble haylage* inoculant	100g bottle	50 tonnes of haylage
ENSURE® granular haylage* inoculant	25kg bag	100 tonnes of haylage
ENHANCE® water soluble corn silage inoculant	50g bottle	50 tonnes of corn silage
ENHANCE® granular corn silage inoculant	25kg bag	100 tonnes of corn silage

\*haylage = alfalfa, grasses, or mix, or cereal

**Chop Length:** Forage that is chopped at the recommended length promotes good packing, better elimination of air and even distribution in the silo. Silage that is chopped too coarse packs poorly and traps oxygen. (See below)

### RECOMMENDED CHOP LENGTHS

CROP/MOISTURE	CHOP
<b>Alfalfa, Legumes and Grasses</b>	
65% - 75% moisture	3/8"
Below 65% moisture	1/4" - 3/8"
<b>Corn or Sorghum</b>	
65% - 70% moisture	3/4"
60% - 65% moisture	1/2"
55% - 60% moisture	3/8"
<b>Small Grains</b>	<b>1/4" - 3/8"</b>

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## SILAGE MANAGEMENT AND TROUBLESHOOTING

### Checklist for Good Silage Management:

- Good feed starts with good seed. Plant high quality varieties selected for improved feed quality and high yields
- Make sure the silo structure is in good condition, free from cracks, holes and poorly fitting doors
- Cut and wilt forage during favourable weather
- Harvest crops at recommended moisture
- Chop at optimum length
- Use a bacterial silage inoculant for more efficient fermentation
- Apply at recommended rates, using a well-calibrated applicator
- Use fresh, non-chlorinated water
- Ensilage forage as quickly as possible
- Level and pack silage well. In bunks, thickness of silage to pack should not exceed 6 inches
- Distribute feed out, remove recommended amount of silage from the unloading face (recommended rate is 4 to 6 inches)
- Recommended method of removing material from bunker silos or piles is with a front end loader (includes scraping from the top down)
- Calculation for packing rate is tractor weight divided by 800 equals tons of silage per hour

### Silage Troubleshooting:

#### Silage Feeds Out Hot or Poor Bunk Life

- Slow feedout
- Excessive length of time in feed bunk
- Warm humid weather
- Long chop length
- Inadequate packing
- Uneven removal of silage from the face

#### Excessive Surface Spoilage

- Crop ensiled too wet
- High dry matter content contributing to air infiltration
- Long chop length
- Inadequate packing
- Lack of tightly sealed cover
- Cover not water-proof or wind-proof
- Slow feed out rate
- High surface-to-mass ratio

#### Spoilage Occurring Within Silage Mass

- High dry matter content contributing to poor compaction
- Long chop length
- Poor distribution
- Inadequate packing
- Air leaks in silo wall or around doors
- Contamination from old, mouldy silage, manure, etc.
- Crop ensiled too wet
- Pockets of grass, weeds or soil

#### Seepage/Runoff

- Crop ensiled too wet
- Loss of water soluble carbohydrate and soluble protein
- Chop length too fine
- High populations of microorganisms in effluent can be an environmental concern around silo and nearby streams and ponds

#### **PICKSEED and Chr. Hansen Ltd.,**

*a Danish-based leader in microbial work have come together to bring Canadian livestock producers the best possible silage inoculants produced under stringent quality assured programs, ensuring and enhancing livestock profitability.*