

Liquid

Ingredients

Common Liquid Ingredients



- Molasses - Cane and Beet
- Condensed Molasses Solubles
- Corn Steepwater
- Condensed Whey
- Brewers and Distillers Cond. Solubles
- Lignin Sulfonates
- Fats

Typical Analysis (As Is)

	<u>Dry</u>	<u>Protein</u>	<u>Organic</u>	<u>Lb/Cu.ft</u>
	<u>Matter</u>		<u>Matter</u>	
Cane	73	3	60	87
Beet	75	8	63	87
CMS	65	20	45	82
Steep	45	18	42	77
Whey	48	5	38	77
Brewers	35	3	32	72
Distillers	35	8	32	72
Lignin	50	3	35	78

Other Ingredients



- Phosphoric Acid
- Sulfuric Acid
- Trace Minerals
- Vitamins A, D, and E
- *Salt*
- *Calcium Carbonate*
- *Potassium Chloride*

Crude Protein Sources



- Urea
- Ammonium Polyphosphate
- Ammonium Sulfate

Special Additives



- Mold Inhibitors
- Propionic Acid
- Surfactants
- Flavors
- Gum or Clay
- Ionophores
- MGA

Liquid Product Characteristics



- Dry Matter Content
 - Oven
 - Karl Fischer
 - Refractometer
- Density
 - Brix
 - Working Density
- Viscosity
- pH

Molasses - AAFCO



- Cane Molasses is a by-product of the manufacture of sucrose from sugar cane. It must contain not less than 43% total sugars expressed as invert. If its moisture content exceeds 27%, its density determined by double dilution must not be less than 79.5 Brix.

Brix



- Brix is a measure of density
- The molasses is mixed with an equal weight of water
- The mixture is allowed to stand for 20 minutes to allow entrained air to dissipate
- Density is measured with a hydrometer

TSAI - Total Sugars as Invert



1 Disaccharide =

2 monosaccharides + 1 water

“Inverted” sugars are converted to
monosaccharides

Storing and Handling Liquids

	<u>Best</u>		<u>Worst</u>
Tank Orientation	Vertical		Horizontal
Tank Shape	Cylinder +Cone	Cylinder	Box
Tank Diameter	<1/2 Depth		>Depth
Tank Material	Poly	Steel	Concrete
Tank Location	Inside, Near Mixer		Outside Distant

Storing and Handling Liquids



	<u>Best</u>	<u>Worst</u>
Pump Type	2" + Gear	1" Centrif.
Pump Location	Beside/below Tank	Beside Mixer
Pump Maint.	Monthly	Huh?
Tank Cleanout	Annunal	Huh?

Storing and Handling Liquids

Best

Worst

Lines

**2"+
Insulated**

1" Bare

**Line
Bends**

45° Elbows

90° Elbows

**Line
Shape**

Straight

Pretzel

SAFETY!



Don't go into a tank
without a big guy who
likes you on the other
end of the rope!

Safety



- Assume that your liquid storage tanks are full of CO₂
- Use a breathing apparatus
- Use a safety line