

Seed Money Project

Sustainable and circular use of agro processing by-products: the case of spent brewers yeast in Ethiopia

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SMP Sustainable and circular use of agro processing by-products: the case of spent brewers' yeast in Ethiopia

Contents:

- general background of the project
- technical innovations in the feed plant of Alema Koudijs (AKF)
- economic feasibility
- conclusion.



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Use of spent brewers' yeast:

- byproduct of beer industry
- high protein % of good quality
- 85-90 % water, 10-15 % DM
- high transport costs when used fresh
- highly perishable, need to inactivate the yeast
- homogenization needed during storage
- drying is possible, but at high costs



In Ethiopia: strong growth of beer production, but poor use of byproducts.

- with some seasonal variation in availability.



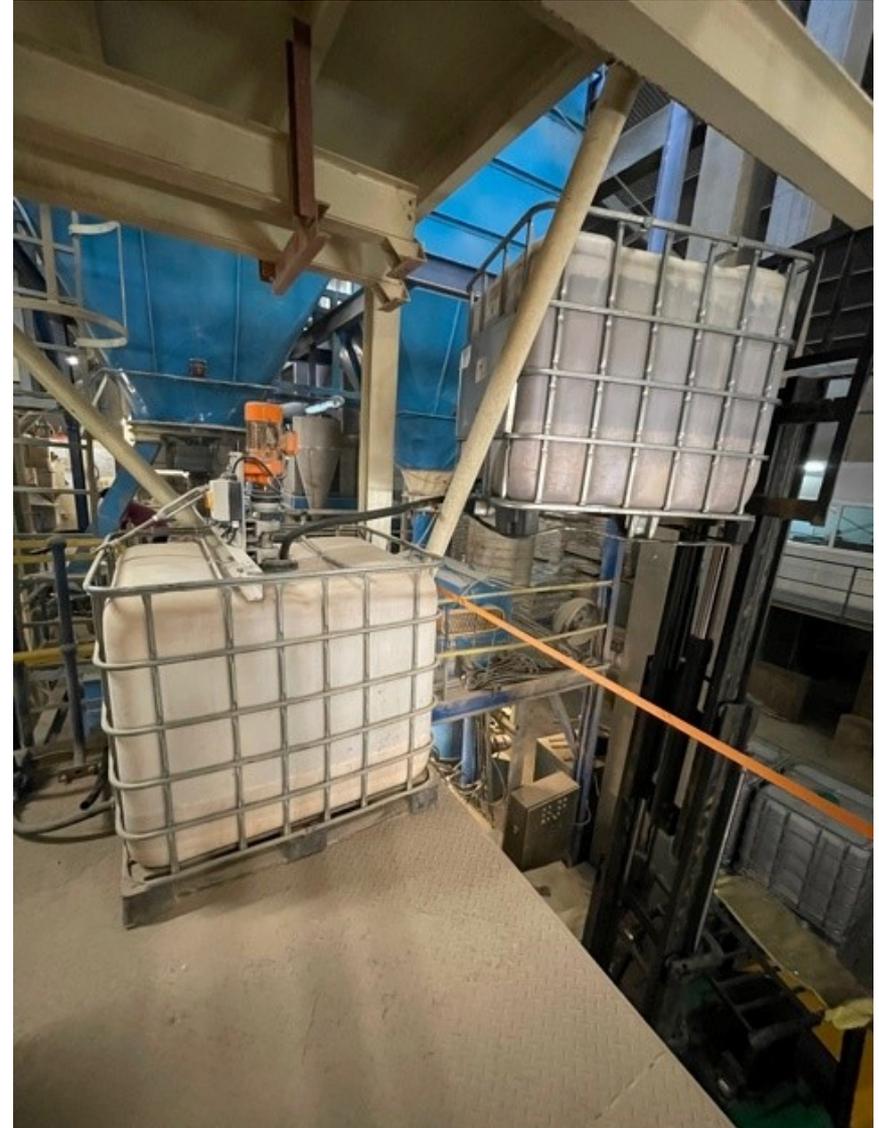
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Objectives SMP:

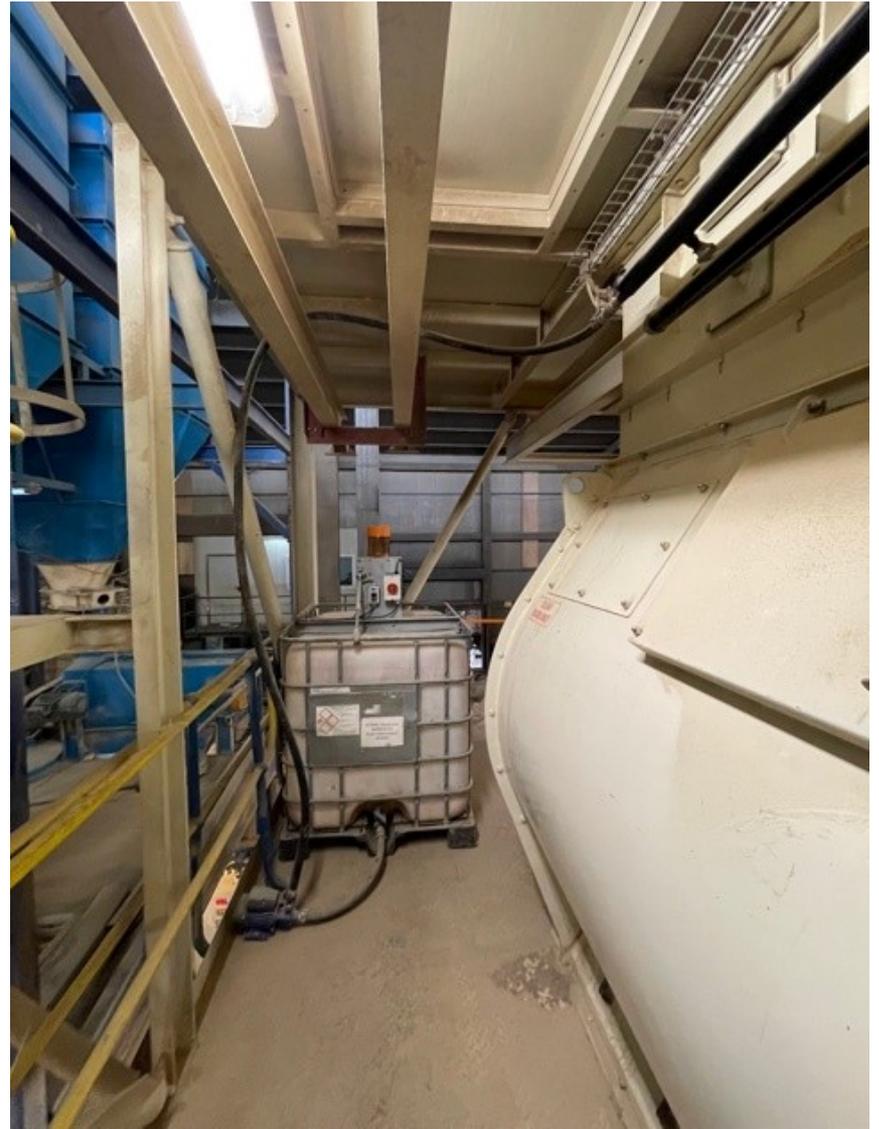
- Brief survey/market study into the availability of brewers' spent yeast, the current uses, aspects of quality etc.
- Adapting machinery and construction of modified equipment in existing animal feed factory
- Participants: De Heus, Heineken, Bavaria, Ottevanger, Ethiopia Feed Manufacturers Association.



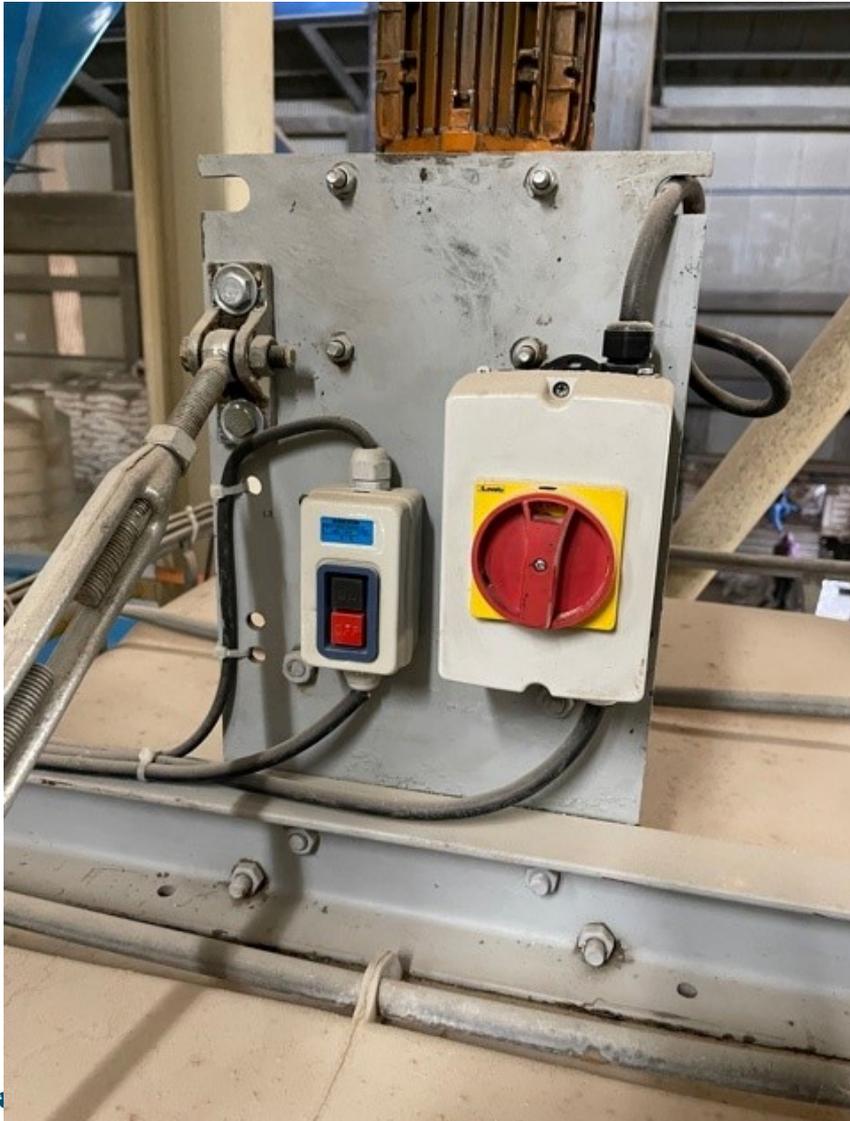
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1) Market and feasibility study.

- production, availability, seasonality of SBY
- quality, consistency
- logistics in handling SBY
- feasibility of investments in SBY use at feed plant
- compare suitability of SBY with other comparable ingredients.

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Breweries Production Capacity

Brewery	Beer Production Capacity	Spent Brewery Yeast	Spent Brewery Yeast
	(Hectolitres)	(Tonnes Wet)	(Tonnes Dry Mater*)
Factory 1	200.000,00	400,00	44,00
Factory 2	600.000,00	1.200,00	132,00
Factory 3	2.400.000,00	4.800,00	528,00
Factory 4	1.500.000,00	3.000,00	330,00
Factory 5	1.500.000,00	3.000,00	330,00
Factory 6	780.000,00	1.560,00	171,60
Factory 7	350.000,00	700,00	77,00
Factory 8	800.000,00	1.600,00	176,00
Factory 9	541.666,00	1.083,33	119,17
Factory 10	709.000,00	1.418,00	155,98
Factory 11	700.000,00	1.400,00	154,00
Factory 12	500.000,00	1.000,00	110,00
Total	10.580.666,00	21.161,33	2.327,75

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Current usage of SBY in Ethiopia/ Brewery

Brewery Factory	SBY Usage
Factory 1	Disposed
Factory 2	Disposed
Factory 3	Temporary storage within factory then given free of charge to farmers
Factory 4	Disposed
Factory 5	Data not available
Factory 6	Disposed
Factory 7	Mixing with SBG, storing on tanker, & then out sourced the distribution
Factory 8	No use/dumping to waste water treatment plant
Factory 9	Disposed
Factory 10	Disposed
Factory 11	Mixed with SBG
Factory 12	No Use

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Distance from Breweries to Alema Koudijs Feed Plc

Brewery	Distance to Feed plan (Km)
Factory 1	500
Factory 2	600
Factory 3	30
Factory 4	40
Factory 5	250
Factory 6	440
Factory 7	170
Factory 8	650
Factory 9	65
Factory 10	800
Factory 11	170
Factory 12	30



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Summary SBY transport cost for breweries nearest to feed plant

Brewery	Distance to Feed plan	Spent Brewery Yeast	Spent Brewery Yeast	Transport cost	SBY needed	SBY Price wet	SBY Price Dry	SBY Price Protein Unit
	(Km)	(T Wet/year)	(T Wet/week)	(tanker-track 43,000 liters)	T/week	(ETB/T)	(ETB/T Dry Matter)	(ETB/Unit Protein)
Factory 3	30	4.800	92,31	15.000	38,46	390	3.545	0,072
Factory 4	40	3.000	57,69	15.000	38,46	390	3.545	0,072
Factory 7	170	700	13,46	33.000	38,46	858	7.800	0,159
Factory 9	65	1.083	20,83	15.000	38,46	390	3.545	0,072
Factory 11	170	1.400	26,92	33.000	38,46	858	7.800	0,159
Factory 12	30	1.000	19,23	15.000	38,46	390	3.545	0,072

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Investment overview

Usage by AKF, 2 % inclusion = approx. 40 tons fresh products weekly.

Equipment needed:

Storage (#tanks, capacity 2 x 20 tons)

Dosing system

Pumping/homogenization system

Transport costs

Maintenance, operational costs

Potential substitution of soybean meal by SBY in Alema Koudijs feed plant

Feed Production	Inclusion rate	SBY use	Transport cost	Depreciation & Manipulation cost *	Total cost	Soymeal Equivalents	Soymeal Price	Soymeal total cost	Saving
Tonnes	%	T	ETB/T	ETB/year	ETB	Tonnes	ETB/T	ETB	ETB
100000	2%	2000	390	1856393	2636393	200	45000	9000000	6363607

Rough calculation:

- comparison with other ingredients highly dependent on market prices
- feasibility really determined by distance between feed factory and brewery
- for good logistical match extra storage capacity may be necessary at brewery
- possible saving AKF between 50K and 100K annually.

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- Conclusion: Spent brewers yeast used fresh certainly a feasible option to improve circularity in animal feed.

• Any questions?