RECP Best Practice Catalogue

Increasing yield of seeds processing

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UNITED NATIONS
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switchmed

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Best Practice - Increasing yield of seeds processing

SECTOR:	**Food & Beverage**
SUBSECTOR:	Manufacture of vegetable and animal oils and fats
PRODUCTS	Edible oils in addition to low & high protein meal
CATEGORY	Process control or modification
APPLICABILITY	Process

COMPANY NAME	---
COMPANY SIZE	Medium

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Description of the problem (Base scenario):	It was observed that the oil content in the final produced meal (the reject portion) is two times higher than the benchmark (1.5-2% vs. 0.8%). Rooting the cause of the low yield revealed that the reason for this can be the fact that the oil is not recovered from the seeds as much as expected as the two rollers of the crusher were both rotating at the same speed.
Description of the solution	Introducing variable speed of the machinery to differentiate the speed between the two rollers will raise the percentage of the oil extracted (yield) from the same quantity of the raw seeds. When the crushing rollers are operating at different speed a shearing action is obtained and it will improve the extraction efficiency. This will lead to a higher yield of oil and decrease its content within the final meal produced.

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Economic Benefits	Operational savings can be established through a higher oil recovery. Each 1000 ton of raw seeds produces 190 ton of crude oil. In case of 0.1% additional oil recovery and total amount of raw seeds of 115,169 t/y, the produced crude oil is 21,882 t/y and the additional oil recovery from implementing this measure ranges between (19-21.8)t/y depending on the type of raw seed. Cost of 1 ton crude oil = 400 Euro. Total cost saving due to change of the speed of the crushing rollers ranges between (7,600-8,800) Euro/yr.
Environmental Benefits	Saving on the natural resources (raw materials).

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Capital investments & financial indicators	The capital investment of introducing variable speed for the crushing rollers is 30,000 Euro. Payback period is 4 years
Suppliers	
Other aspects	Possibly implementation of this measure requires production stoppage and has to be executed during the shut down time (maintenance period).
Implementation	This measure is retained for a study, the company needs to check the possibility of introducing variable speed drive to the existing crusher.

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Replicability sectors	**The same concept can be replicated in:** Oil extraction plants.
Aspects to investigate for replicability	Compare oil content in the produced meal with the benchmarks. Check the used method for crushing.
Useful resources	http://lipidlibrary.aocs.org/OilsFats/content.cfm?ItemNumber=40335 http://www.ifc.org/wps/wcm/connect/1e6d9780474b37b89a2bfe57143498e5/FINAL_Feb+2015_Vegetable+Oil+Processing+EHS+Guideline.pdf?MOD=AJPERES