

## ECONOMICS OF SUNFLOWER DEHULLING

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### ABSTRACT

The profitability of sunflower dehulling for crushing and interest of dehulled sunflower meal for animal feeding are not compatible in all economical circumstances : the meals (source of protein) and oil markets available to the processor, the cereal price (source of energy), economical uses of the removed hulls (actually burnt for steam production of the plant) and good technical control of the process (particularly control of oil losses in hulls) are important in deciding whether to dehull.

### KEY-WORDS

Dehulling, meal, oil, hulls, market, feeding.

### INTRODUCTION

The technical feasibility of sunflower dehulling has been studied in the framework of an interdisciplinary study, supported by European Union (ECLAIR, AGRE.0029), and led, from may 1990 to april 1994, by CETIOM, the technical center of the french oilseed producers. This program includes a study on the economical feasibility of dehulling which takes in account the crushing and feeding points of view.

Total french consumption of sunmeal rises approximatively at 700 000 MT (1994). Imported partially dehulled meal from Argentina (crude protein content : 33%) represent 150 000 MT. So, the main part of consumed sunmeal are actually non dehulled meal (crude protein : 29%). This consumption is actually divided in the following manner : 43 % for cattle, 32 % for poultry (layers), 15 % for rabbits (a specific animal production in France) and only 10 % for pigs.

Three french plants have facilities for dehulling. The aim of the present study is to define a method of working for determining economical conditions in which it is interesting to dehull.

## METHODS

The conclusions of this study are supported by the issues of two french organisms : CEREOFA which is a research center in feedstuff economics and the data bank of feedstuff industry, with advices of the Bunge group for crushing aspects.

Feedstuffs are composed of many raw materials (mainly cereals as source of energy and meals as source of proteins) available on the market. Intensive systems for animal feeding actually require specific feedstuffs produced at the less cost and fitting exactly the animal needs. An application program has been used for taking in account these two constraints and defining the competition level of sunmeals, particularly in comparison with soymeal. Increased value of dehulled sunmeal has been evaluated in different market situations as for its interest in animal feeding.

## RESULTS

### 1 - Crushing profitability

Dehulling cost must be payed by increased value of dehulled sunmeal. This last one is the result of process expenses and receipts : expenses essentially include investments, running costs, lost of oil in the hulls and lowering of meal output ; receipts essentially include the use of hulls burnt for steam production and improvement of the plant flow. Several market factors are acting on crushing profitability :

- ◆ **Oil price** : the higher is the oil price, the lower is the profitability because of the oil losses in hulls.
- ◆ **Energy cost** : the higher is the energy cost, the higher is the profitability because of hulls burning for steam production.
- ◆ **Non dehulled meal price** : a high market price of the non dehulled sunmeal increases its production and-decreases interest for dehulled meal.

The "minimum" increased value of dehulled meal, necessary for paying dehulling cost, has been determined in different market situations (tab. 1) : 4 situations for non dehulled meal (50, 60, 70 et 80 FF/100Kg), 3 situations for crude oil (300, 350 et 400 FF/100Kg) and 3 level of removed hulls. The hull price is estimated to 35 FF/100Kg.

This table shows that the worst situation is the one where the crusher is processing a well dehulled meal (removed hulls rate of 20%), while non dehulled meal and crude oil have high prices (80 FF for non dehulled meal and 400 FF for crude oil. In this case, the "minimum" increased value of dehulled meal, necessary for paying dehulling cost is close to 31 FF/100Kg.

Non dehulled meal price (FF/100Kg)	Crude oil price (FF/100Kg)	Removed hulls rate		
		10%	15%	20%
50	300	5.3	8.8	13.2
	350	5.7	9.3	14
	400	6	9.9	14.9
60	300	7.5	12.4	18.6
	350	7.8	13	19.5
	400	8.2	13.5	20.4
70	300	9.6	16	24.1
	350	10	16.6	25
	400	10.3	17.2	25.9
80	300	11.8	19.6	29.6
	350	12.1	20.2	30.5
	400	12.5	20.8	31.4

*Table 1. "Minimum" increased value of dehulled meal (FF/100Kg) necessary for covering dehulling technology cost (Bunge).*

This price has to be compared to feeding constraints. Nevertheless, it must be pointed out that sunflower seeds with a high protein content need not necessarily a high removed hulls rate.

## 2 - Interest of dehulled sunmeal for feeding

Interest of dehulled sunmeal for feeding mainly depends on prices of cereals and soymeal. Two different market situations have been studied for 3 qualities of dehulled sunmeal ("35", "37" and "40" Profat) : a first period (first-six month of 1994) with a high price for soymeal, and a second period (second-six month of 1994) with a normal price for soymeal. Cereal price is at a normal level in the first period and at an unusually low level in the second period (tab. 2).

	Period 1	Period 2
Wheat (FF/100Kg)	98.6	89.1
Soymeal (FF/100Kg)	142.4	115.6
Wheat/soymeal	0.69	0.77
Increased value SFM "35" (*)	18.9	13.5
Increased value SFM "37" (*)	22.8	16.5
Increased value SFM "40" (*)	32.4	21

(\*) Profat

*Table 2. Increased value in comparison with non dehulled meal in 2 different market situations.*

These results clearly show that the increased value of dehulled sunmeal (vs non dehulled sunmeal) is markedly higher in the period 1 : high level of

soymeal price and low energy/protein rate, consequence of a high price for wheat. Thus, this situation is much more profitable for crushing (see previous data).

Nevertheless, other factors have to be taken into account in such a study, as for example the proportion of dehulled seeds. In fact, the previous results are based on the following assumption : crushing of 1.200.000 MT of seeds, among which 20% for dehulling. Disponibility of non dehulled sunmeal on the market ("29" ProFat) goes down with dehulling, inducing a higher price for this meal quality, a better valorization by crushing and consequently a lower interest for dehulled meal.

Moreover, the price difference between non dehulled sunmeal ("29") and sunmeal "33" imported from Argentina (fig. 3) has been going down in France during the two last years : 18 FF/100Kg in average for 1992 and 1993, 9 FF/100KG in 1994 and 6 FF/100Kg in 1995.

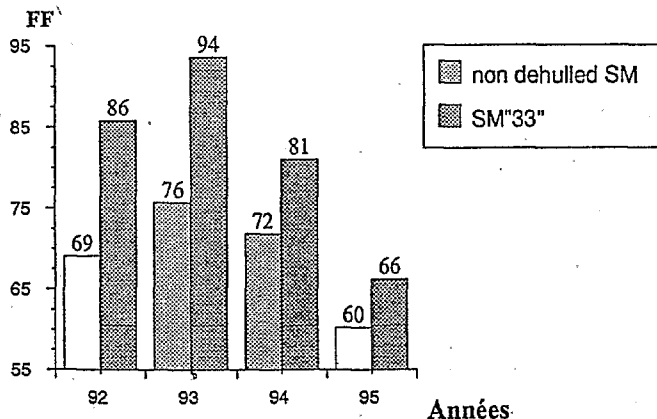
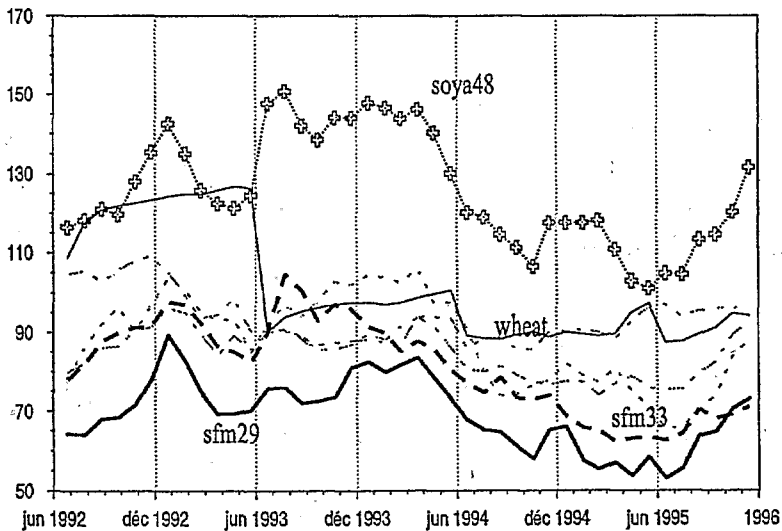


Figure 3. Price evolution of non dehulled meal and meal "33".

This tendency is considerably modifying the previous data concerning sunmeal market and no dehulled sunmeal has been processed in France in 1995 and 1996.

### CONCLUSIONS

A method of working for determining economical conditions in which it is interesting to dehull has been defined : it has been shown that dehulling technology can increase the competitiveness of sunmeal in some particular market situations, but there is not necessarily agreement between crushing and feeding interests. Nevertheless, some erratic price tendencies can considerably modify the traditional market rules and principles used in animal feeding.

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