• *Report on Fats and Oils*

Do It Yourself

TO MANY FOREIGN OBSERVERS it must seem as if Americans have taken specialization of function and carried it beyond the limits of logic or economic advantage. It also sometimes seems as if the pressure is all one way, i.e., toward further atomization of task and increase in size of unit. Yet neither is entirely true, because within the structure there are constant back pressures, to simplify, to eliminate double handling and over marketing, to reduce high labor and investment cost. In recent years there has been considerable centralization in the animal section of agriculture, particularly poultry growing, processing and marketing. There also appears to have been some centralization in bean processing and feed manufacturing. Some conservatives have fought these developments but nearly always have been proven wrong. The simple fact seems to have been that the better way was in the direction of more specialization. But the logicians keep looking for a weakness somewhere, and some of them keep aiming at the soybean processing complex. In a sense this is surprising since margins in this field have been tight for years. But in another sense it is not surprising since there is an apparent anomaly in moving beans full circle from the farm to the country elevator to the processor, and then—as meal—back from the processor to the country elevator to the farm. The only *apparent* difference being grinding plus removal of a high price fat and sometimes replacement with a low price fat. Nearly every time that the tallow-soybean oil spread closes up, as it has in the past couple of weeks, new suggestions for country bean fabrication appears, and old suggestions are dusted off. Since feeding whole beans on the farm has proven to be nutritionally hopeless, the suggestions usually revolve around grinding them at the country station level, where, in many cases, rudimentary to advanced grinding facilities are already in place for grains. Country fabrication research gained considerable impetus in the early 1950's when fats began to be added back to feeds in increased volume in response to impressive findings in research on calorie/protein ratios. This substitution of one fat for another increased the apparent anomaly.

It appears that slaughter fats alone added to feeds now exceed 650 million lb/yr. Also there is addition of a considerable amount of soapstock added plus the 1% or so oil left in the meal after solvent processing. It all adds up to an impressive number of manufactured or residual calories mostly replacing the natural soybean oil calories originally in the beans. After years of effort, all the work on the problem has come to a zero result in terms of volume of beans involved.

In the 20 years since a trypsin inhibitor was first reported in raw beans, nutritionists have discovered increasing problems in feeding raw or even heated beans to animals. These range from changes in blood clotting, to soft carcass fat, to soft butter, to triggering release of excessive ammonia from urea, to rancidity of feed, to binding of zinc, to generalized nutritional defects apparently associated with poor availability of both fat and protein. As these difficulties have become more visible, efforts to devise methods to overcome them have become increasingly complex. Because grinding wasn't enough, emphasis shifted to heat, then moist heat plus pressure. The current vogue is toward moist heat plus pressure plus flaking or rolling or puffing. Suggestions such as these require complicated equipment, which implies substantial capital investment, skilled operators, and increased costs. This means gradual but sure departure from first premises, i.e. that low cost handling and simplification of fabrication at the country level can offset economies of scale at processing plants. But probably the fatal flaw in country fabrication suggestions is that once the decision is made to depart from simple grinding, a whole maze of quality problems is opened up particularly in the area of heat damage to delicate protein. This is a real consideration when talking about a batch process system run by part time and/or unskilled labor. Animal feeding has become an astoundingly exact science, and there is no reason to expect that the trend to greater complexity and precision will be reversed. In industrial situations, make/buy decisions which this in a sense resembles, are made on basis of cost and quality. Cost determinations are uncertain but even the most complicated suggestion, probably the only nutritionally sound one, i.e. flaking plus moist heat plus pressure, should cost somewhat less than full scale processing, if investment amortization "costs" are ignored. However, at any sign of general acceptance of such flakes as a feed ingredient, processors would probably jump in and start offering unspent flakes themselves. Since processors would have bigger capacity, more know-how, better quality control and an already standing investment, they would likely dominate the flake market fairly quickly. Processors might not mind a situation where they could sell substantial quantities of oil via the route of leaving it in the flakes.

Another economic facet of the subject is that most of the feasibility studies seem to assume that development of an acceptable fabrication system would have no influence on the relationships that it is supposed to be

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