FATS AND PROTEINS RESEARCH FOUNDATION, INC.

Director's Digest

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"DRY" FAT UPDATE

Since the last report on dry fat from FPRF in September, 1981, we have been actively pursuing procedures to make a dry fat which would have wide application. The problem has proven to be an extremely challenging one. Thus far, there have been no breakthroughs in the development of a low-cost, dry fat product. We have followed up on the work that Dr. Boehme did in identifying suitable carriers and have obtained cost figures which will be helpful in considering a product or products to manufacture.

The number of suitable carriers for fat is quite limited since absorbability characteristics are not the same as for water-based materials such as molasses. To complicate the situation, some products may be suitable for certain markets, while unsuitable for other markets.

The potential fat carriers, which we have worked with or are familiar with, can be classified as either nutritional or non-nutritional. They are listed below in terms of fat-carrying capacity, price and applicable markets.

INGREDIENT	F.O.B. PRICE/CWT. $	FAT CARRYING CAPACITY	MARKET
Nutritional			
Puffed rice or wheat	$50.00	75-80%	All Species
Wheat middlings	4.50	30-35%	All Species except broilers
Wheat Bran	4.50	40%	Cattle & Sows
Beet Pulp	6.50	30-40%	Cattle
Alfalfa Meal	$4.00-7.50	30% (est.)	All Species except broilers
Non-Nutritional			
Verxite (expanded mica)	$21.00	70%	Cattle
Corn-cob flour	5.50	50%	Cattle & perhaps swine
Bentonite	2.50	20%	Cattle

The cost of transportation from the source to the particular rendering plant must be added to the ingredient cost. A reasonable estimate for trucking costs would be $1.10-1.25 per loaded mile. Thus, Verxite, which has a bulky density of only 7 pounds per cubic foot (or 10 tons in a semi-trailer load) would incur a freight cost of $220-250 for a 200-mile haul. This would add $1.10-1.25 per cwt. to the ingredient cost. However, Verxite is available at only two points: one in South Carolina and one in Missouri, which would add further to the ingredient cost for many renderers. Puffed grains are also commercially available in only a few locations and that, plus extremely low bulk density, would add substantially to the cost. Corn-cob by-products are manufactured in the midwest. Wheat middlings, wheat bran, alfalfa meal and beet pulp are generally available through a wide geographical area.

It must be understood that, in considering a dry fat, renderers are really talking about setting up a small feed mill within their plants. Manufacturing costs will be about the same, regardless of the carrier used. Approximate costs per ton of final product are as follows:

Storage and conveying	$1.00
Blending	1.00
Bagging	30.00
Warehousing & loading	.50
Delivery (reasonable distance)	20.00
	$52.50 ($2.63/cwt. of product)

For an example of the final cost of a product, consider corn-cob meal at $140.00 per ton ($7.00/cwt.) delivered, fat at $11.50/cwt. and manufacturing and delivery at $2.63/cwt. The product would have the following cost:

Ingredients (per cwt.)

50# corn cob meal	@ 7¢ =	$3.50
50# fat	@ 11.5¢ =	5.75
Manufacture & del.	@ 2.6¢ =	2.60
Total		$11.85 per cwt.

On a fat basis, cost per pound of fat would be 23.7¢. Similar calculations can be made for the other carriers, bearing in mind that variable transportation costs for in-bound ingredients and delivery of finished product would significantly affect final cost.

It is difficult at this time to make a definite recommendation for a carrier. While fat on Verxite is suitable for cattle, the fat is poorly utilized by swine. Fat on corn-cob flour is useful for cattle, but, if a high level of fat is used as in sow feeds, dilution by non-nutritive corn-cobs might be excessive. Puffed grains are probably too expensive, particularly considering low-bulk density and limited geographical availability. However, the high capacity for fat and the nutritional value of puffed grains have given us reasons to find ways of making such products. Products such as wheat middlings, wheat bran, etc., which have relatively low carrying capacity for fat, might be useful at lower levels of fat usage in feeds.

There are products being marketed at present containing 40-80% fat, but with a cost of 45-50¢ per unit of added fat. These might have application for special uses such as baby pig feeds or for low-level use where a small amount of added fat might be useful. However, such products are too expensive for general use.

FPRF is supporting a project at the University of Georgia to find out if 5% fat fed to sows for 35 days before farrowing would be as effective as 10-15% fat fed for 5-7 days before farrowing. If successful, this project would permit the use of carriers such as wheat middlings,

with a lower level of added fat, which would contribute to the nutrient content of the total feed, in addition to the added fat. Such products would also be useful for other applications, such as turkey feeds, which might call for lower levels of fat.

In addition, we are considering a project proposal from Kansas State University to study the usefulness of extruders or a small, batch puffer to process grains to use as fat carriers. Although processing costs for grain extrusion are relatively high ($2-2.50 per cwt.) and the small grain puffer under consideration is labor intensive (approximately 200 lbs. of product per manhour), one of these processes might have application in making a high-capacity, nutritional carrier for fat.