I will next call on Mr. E. C. Damrow. I am glad, ladies and gentlemen, to introduce to you Mr. Damrow. He is one of the men that really helped to get this convention at Fond du Lac.

FEED VALUE OF WHEY

By E. C. Damrow

When the cheese maker in our home factory put in a whey separator, the general talk among the farmers was, "If he is going to take that little bit of fat out of the whey, then he might just as well keep the rest too." The farmers did not think there was any feed value left in the whey, and this is still the general feeling among most farmers—they do not realize the feed value of the whey.

Your secretary has requested me to handle this subject, and I am going to show the actual feed value in by-products of milk in dollars and cents, which every patron of a cheese factory or creamery should know and try to utilize. There is real hidden money in these by-products.

All the feeding experiments made at the universities are usually based on skim milk and buttermilk, which are the major by-products of milk in practically every state except Wisconsin especially in the cheese section of our state where whey is the feed for the young stock.

The feed value in skim milk and buttermilk has been reported in Henry's book, "Feeds and Feeding", on page 203; and the feed value in skim milk and whey has been compared as follows:

Solids in	*Skim milk, lbs.*	*Whey, lbs.*
Sugar	5.00	5.00
Albumen	.75	.75
Casein	2.7	.....
Ash	.7	.4
	9.15	6.15

"Total solids skim milk, 9.15 pounds; whey, 6.15 pounds, or whey contains a little better than two-thirds as much solids as skim milk, and naturally is worth two-thirds of the feed value of skim milk."

I know of cases where the skimmed whey was powdered, and out of a hundred pounds of whey they got better than six pounds of whey power with a moisture content of 4 to 5%.

The following information has been taken from L. C. Thomsen's "Value of Skim Milk and Buttermilk for Livestock Feeding." (Send for a copy—Write the Wisconsin Dairy School, Madison, Wisconsin.)

1. "There composition is such that skim milk and buttermilk are exceptionally well adapted for building muscles and the bony framework of young animals, according to Henry and Morrison."

2. "Feeding trials have shown, that in general skim milk is superior to whole milk for calf feeding, after the calves have once become adjusted to the change."

There is little difference in composition between skim milk and whey.

3. "For hogs, feeding trials have demonstrated that, where skim milk or buttermilk have been fed as a supplement to corn or other cereals, the gains are larger than with any other substitute."

4. "Experiments prove that when fed in combination with grains, 500 pounds of skim milk are equal to at least 100 pounds of grain."

Corn at $1.00 per bushel; 100 pounds equals $1.785. Therefore 500 pounds skim milk equals $1.785 or 35.7 cents per hundred, and ⅔ of this is the value of whey, 23.8 cents per one-hundred pounds.

5. "Pigs fed skim milk or buttermilk in addition to corn gained 59.61 percent (almost 60 percent) faster than did those receiving corn alone, and 4.18 pounds of skim milk and buttermilk had the same value as one pound of corn, according to composite results of experiments at seven different stations."

And again if 4.18 pounds of skim milk equals one pound of corn, 100 pounds of skim milk equals 23.9 pounds of corn. At $1.00 per bushel—39.8c per 100 pounds of skim milk or 28.8 cents per 100 pounds of whey.

Feed to produce 100 pounds gain in weight in hogs:

Average Daily Ration	Total No. of Pigs	Av. initial Weight Per Pig	Av. final Weight Per Pig	Av. daily Gain Per Pig	Feed to Produce 100 Lbs. gain
5.09 corn	53	106.42	186.61	1.05	492.88
5.09 corn	....	.....	.....	.....	302.07
12.58 buttermilk and skim milk	53	108.38	226.46	1.66	799.40

492.88 pounds corn equals 302.07 pounds corn plus 799.40 skim milk or almost 500 pounds corn is equivalent to 300 pounds corn plus 800 pounds skim milk. Therefore 200 pounds of corn is equal to 800 pounds of skim milk. 200 pounds corn at $1.00 per bushel equals $3.57 and 800 pounds skim milk equals $3.57 or 44.6 cents per 100 pounds and whey 29.7 cents or ⅔ the value of skim milk.

The above is from experimental feeding stations on feeding skim milk and buttermilk, at a very conservative value.

The following is from an experimental feeding of whey by F. P. Baker, St. Cloud, Wisconsin:

Bought 8 seven-weeks old Poland China pigs June 16, 1928, at $3.00		$24.00
Seed for one-fourth acre pasture, oats and rape		1.25
Ground barley	$10.25	
Flour middlings	12.40	
Hominy feed	19.80	42.45
Total cost of pigs, seed and feed		$67.70

The hogs were fed mostly whey and very little grain. Starting with 80 pounds of whey, which was increased to 240 pounds daily in the last two months, or an average of 180 pounds of whey, for 117 days (three mos. 26 days) making a total of 21,060 pounds of whey.

The hogs were sold in less than four months of feeding at the age

of 5 months 16 days weighing an average of 196 pounds or a total weight of:

1,584 pounds @ 10½c	$166.32
Cost of pigs and feed	67.70
Net gain for pasture and whey	$ 98.62

$98.62 ÷ 210 = 47c per 100 lbs. whey and what little the pasture produced.

If the hogs would have sold for eight cents per pound the value of the whey would have been 27 cents per hundred.

The hogs know good whey as well as the little pigs know sweet milk. The whey tank was thoroughly cleaned every other day, except for one week, and the hogs soon voiced quite emphatically a protest against such slop and insisted on good wholesome whey.

Experiment made by Julius Kuhlow:

Bought five 6-weeks old Chester White pigs, April 18, 1935 @ $4.25		$21.25
300 lbs. Rye Middling @ $1.00 per C	$ 3.00	
1440 lbs. oats @ $24.00 per ton	17.28	20.28
		$41.53

Roughage around straw stack

Hogs sold October 28, 1935, fed 6 mos. 10 days, or 190 days: (243 lbs. average hog).

1215 lbs. @ 10c	$121.50
Cost of feed and pigs	41.53
	$ 79.97

Pigs consumed daily from 70 to 240 lbs. of whey, or an average of 155 lbs., a total of 29,450 lbs. of whey.

$79.97 ÷ 294 = 27c per C, the value of the whey and what little the straw produced.

I hope that cheese makers and butter makers, as well as the farmers will also make these tests on feeding. Our agricultural departments at Madison, Wisconsin, will be only too glad to help and work with you.

I shall appreciate it very much if you will make such experimental feedings, keeping an absolutely accurate record of same, and send me your results. I shall then compile them and give you a summary of the complete report at your next convention which, I hope, will be bigger, better, and of far more educational value to us all.

MR. PRESIDENT: Ladies and gentlemen, yesterday afternoon we had some discussion about the 350 inspectors we were going to have and Mr. Hill is here today and I think that he would be glad to explain to you what he knows about this; and I take great pleasure in introducing Mr. Hill.

ADDRESS

By MR. HILL

First of all I want to say how glad I am to be here and what a perfectly marvelous attendance there has been at this convention. I have attended a good many cheese makers conventions before, but I never have seen any such audience as has been here this morning. Naturally, you would appear to see your Governor, but you are here again; and secondly, I want to congratulate the people who furnished the cheese and the people who put it on display.