

**ASSOCIATED MATERIALS
Supporting
STATEMENT OF SCOTT BURLESON
WESTFARM FOODS
at the
UNITED STATES DEPARTMENT OF AGRICULTURE PUBLIC HEARING
ON CLASS III AND IV MILK PRICING FORMULAS**

Re: Proposal No.1

*Federal Milk Market Order Hearing
Docket No. AO-14-A74, DA-06-01*

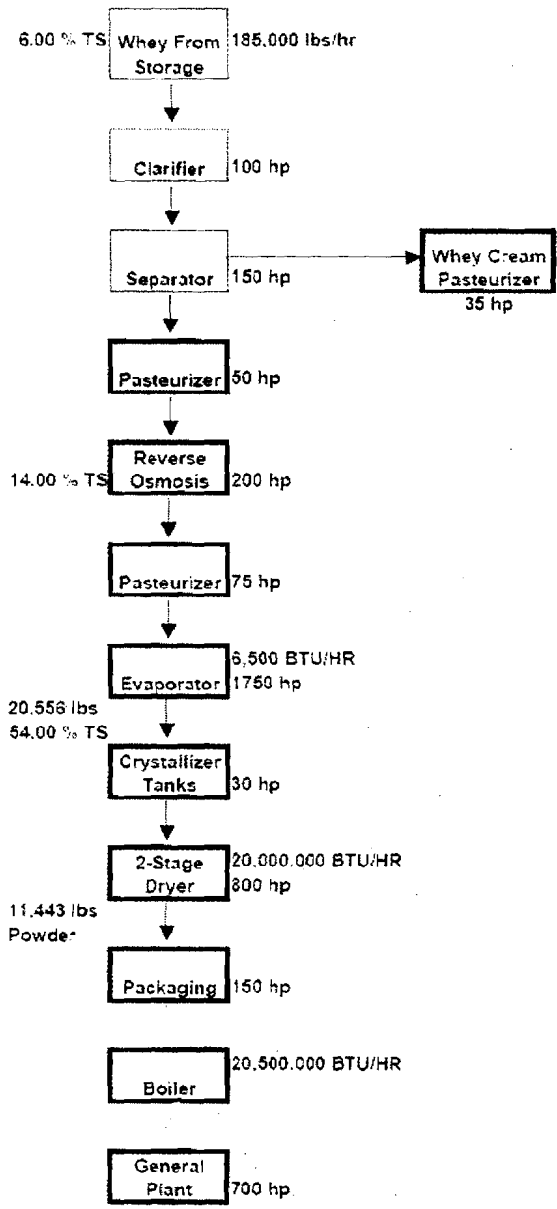
**Table 1. Comparison of Whey and Nonfat Dry Milk Drying Costs
Based on Venkat Testimony, May 2000 FMMO Class III Hearing**

	Dilute Whey	Per Lb Dry Product (6.19 lb /cwt Dilute Whey)	Skim	Per Lb Dry Product (9.28 lb/cwt Skim)
Base Liquid Lbs				
Solids	6.00		9.00	
Water	94.00		91.00	
Total Volume	100.00		100.00	
Evaporation to 54% Solids				
Lbs Water Removed	88.890		83.330	
<u>÷ Lb Water Removed / Lb Steam</u>	<u>8.000</u>		<u>8.000</u>	
= Lbs steam required	11.100		10.400	
<u>x \$Cost /1,000 lbs Steam</u>	<u>\$7.99</u>		<u>\$7.99</u>	
= Steam Cost	\$0.089	1.435¢	\$0.083	0.897¢
Crystallization				
KWH for Refrigeration	0.2		none	
<u>x Cost / KWH</u>	<u>\$0.058</u>			
= Refrigeration Cost	\$0.012	0.188¢	\$0.000	0.000¢
Drying to 97% Solids				
Lbs Water Removed	4.930		7.390	
x BTUs required	11,000		15,340	
<u>x Cost per Therm</u>	<u>\$0.799</u>		<u>\$0.799</u>	
= Dryer Gas Cost	\$0.088	1.421¢	\$0.123	1.321¢
Additional Power Required (2MM pound / Day plant)				
Additional HP installed	440			
HP used (@ 75%)	330			
KWH / HP	<u>0.748</u>			
KWH	247			
<u>Cost / KWH</u>	<u>\$0.058</u>			
Additional Power Cost / Hr 4,875 Lbs Produced / Hr	\$14.33	0.294¢		0.000¢
Total		3.338¢		2.218¢

Chart 1

COMPARISON OF PROCESS FLOW STEPS TO DRY WHEY POWDER vs NFDM POWDER

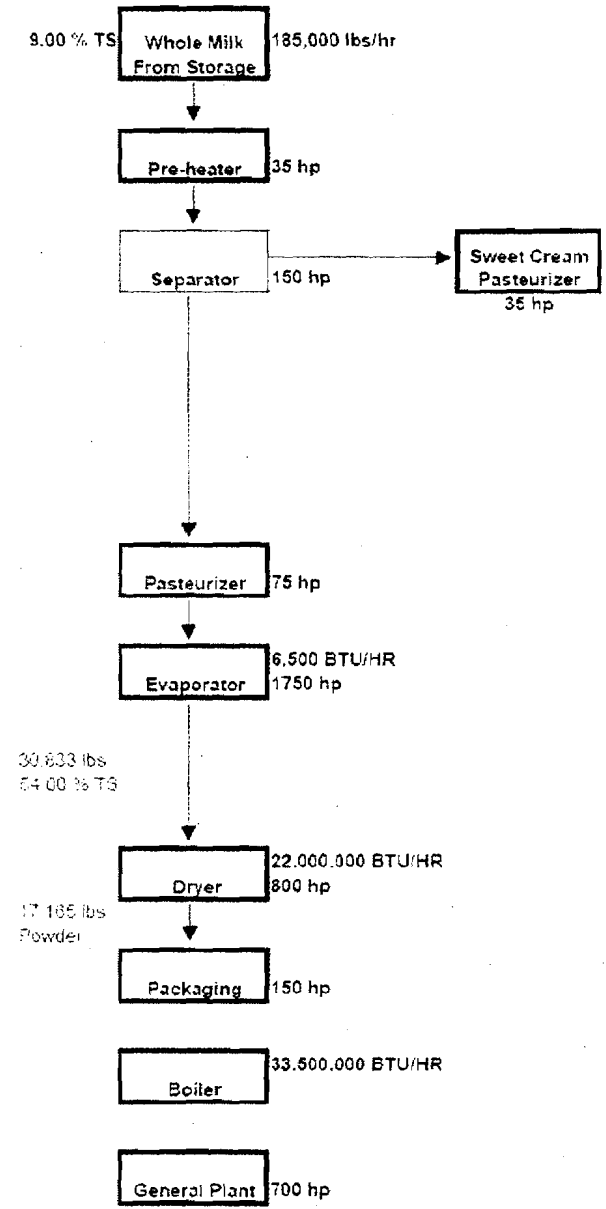
Whey Powder Process Flow



Whey Totals:

Power	Gas
4040 hp	40,506,500 BTU/HR
3108 kw	41 MMBTU's
0.2716	0.0035
KWH per lb product	MMBTU per lb product

NFDM Powder Process Flow



NFDM Totals:

Power	Gas
3695 hp	55,506,500 BTU/HR
2842 kw	56 MMBTU's
0.1656	0.0032
KWH per lb product	MMBTU per lb product

**Table 2. Energy Cost Differences for Whey and NFDM Drying
Using Reverse Osmosis in Whey Drying**

	<u>Whey Processing</u>		<u>NFDM Processing</u>		<u>Whey - NFDM</u>
	Diluted or Per Hour	Per lb. Finished Product	Diluted (Skim) or Per Hour	Per lb. Finished Product	Difference (Cost per lb of product)
Composition (pounds)					
Solids	6.00%		9.00%		
Water	94.00%		91.00%		
Total Volume	185,000		185,000		
Pounds produced per hour:	11,443		17,165		33.3%
Whey Reverse Osmosis (RO) to 14% Total Solids					
Water removed	105,714				
HP used	250				
KWH / HP	0.769				
KWH	192.31				
Price / KWH	\$0.0580				
Additional RO Power cost	\$11.15	\$0.0010			\$0.0010
Evaporation to 54% Total Solids					
Water Removed	58,730		154,167		
KWH for Evaporation	1,346		1,346		
Energy Cost per KWH	\$0.0580	\$0.0068	\$0.0580	\$0.0045	\$0.0023
BTUs required	6,500		6,500		
x \$ per therm	\$0.7990	\$0.0000	\$0.7990	\$0.0000	
Evaporation cost	\$78.13	\$0.0068	\$78.13	\$0.0046	\$0.0023
Whey Crystallization					
KWH for refrigeration	23				
Price / KWH	\$0.0600				
Refrigeration cost	\$1.34	0.0001		0.0000	0.0001
Drying to 97% Total Solids					
Water Removed (Lbs)	9,112		13,668		
KWH for drying	615		615		
Price / KWH	\$0.0580	\$0.0031	\$0.0580	\$0.0021	\$0.0010
BTUs required	20,000,000		22,000,000		
\$ per therm	\$0.7990	\$0.0140	\$0.7990	\$0.0102	\$0.0037
Drying cost to 97% Ttl Solids	\$195.49	\$0.0171	\$211.47	\$0.0123	\$0.0048
Additional Power Required					
KWH for general plant	904		854		
Price / KWH	\$0.06	0.0046	\$0.06	0.0029	0.0017
BTUs required for Boilers & Plant	20,500,000		33,500,000		
\$ per Therm	\$0.80	0.0143	\$0.80	0.0156	-0.0013
Cost of Additional Power	\$216.22	0.0189	\$317.19	0.0185	0.0004
Total Electric Cost	\$178.68	0.0156	\$163.29	0.0095	0.0061
Total Gas Cost	\$323.65	0.0283	\$443.50	0.0258	0.0024
TOTAL UTILITY COST	\$502.33	0.0439	\$606.79	0.0354	0.0085
RO Membrane cost for Whey					0.0036
Total Energy Cost Difference					0.0121

Table 3. Additional Equipment Required for Whey Processing

Type	Qty	Capital Investment	Annual Depreciation ¹	Annual Cost of Capital ²	RO Annual Membrane Replacement	Annual Equipment Cost Difference
Clarifiers	2	900,000	45,000	72,000		117,000
Pasteurizer	1	260,000	13,000	20,800		33,800
R/O System	1	665,000	33,250	53,200	146,650	233,100
Crystallizers	6	1,200,000	60,000	96,000		156,000
Dryer Cost Difference		600,000	30,000	48,000		78,000
Building Costs		1,100,000	55,000	88,000		143,000
Total WFF with R/O		\$ 4,725,000	\$236,250	\$378,000	\$146,650	\$760,900
Vencat Capital Cost²		\$ 5,600,000				
Annual pounds of whey produced (same as Vencat analysis)						41,000,000
Equipment Cost			\$0.0058	\$0.0092	\$0.0036	\$0.0186

¹ Assume 20 year life for the equipment and 20 year life for the building.

² Assume 8.00% Cost of Capital.

Table 4. Comparison of Cost to Dry Whey vs. NFDM

<u>Source</u>	C.K. 2000	C.K. 2005 ¹	WFF (RO) 2005 ²
Energy	0.7740	1.1200	0.8592
Cost of Capital ³	1.1000	1.1000	0.9220
Depreciation	0.6850	0.6850	0.5762
Sub-Total	2.5590	2.9050	2.3574
RO Membranes ⁴	-	-	0.3577
Total cents per lb.	2.5590	2.9050	2.7151

¹ CK 2005 was adjusted for current energy rates

² WFF (RO) uses the same energy rates as CK 2004

³ WFF capital cost reduction driven by R/O and smaller building costs

⁴ WFF(RO) has a trade off between energy and RO membrane costs