

TABLE 7  
*Electrophoretic analyses of Cheddar cheese proteins*

Sample	Date of analysis	Treatment	Rel. concentration as—		Mobility ( $1 \times 10^5 \text{ cm}^2/\text{sec}$ volt)
			ascending	descending	
1	1/24/57	Pasteurized, no $\text{H}_2\text{O}_2$	(%)		
			A*31.4 B*62.2 C* 7.3	A 17.3 B 82.7	A -1.90 B -4.50
2	1/15/57	Pasteurized, 0.1% $\text{H}_2\text{O}_2$	A 37.0 B 49.7 C 13.3	A 28.2 B 71.8	A -2.28 B -5.23
3	2/1/57	Pasteurized, 0.2% $\text{H}_2\text{O}_2$	A 24.3 B 67.3 C 8.4	A 18.1 B 63.8 C 18.1	A -1.70 B -4.41 C -6.78
4	1/17/57	Pasteurized, 0.5% $\text{H}_2\text{O}_2$	A 33.0 B 51.8 C 15.2	A 30.0 B 70.0	A -2.08 B -5.06
5	1/14/57	120° F., no $\text{H}_2\text{O}_2$	A 32.9 B 53.9 C 13.2	A 27.0 B 73.0	A -2.32 B -5.28
6	1/22/57	120° F., 0.1% $\text{H}_2\text{O}_2$	A 29.8 B 52.2 C 18.0	A 18.0 B 82.0	A -2.25 B -5.19
7	1/21/57	120° F., 0.2% $\text{H}_2\text{O}_2$	A 35.3 B 55.4 C 9.3	A 22.4 B 63.4 C 14.2	A -2.20 B -4.76 C -6.22
8	1/18/57	120° F., 0.5% $\text{H}_2\text{O}_2$	A 33.5 B 49.1 C 17.4	A 30.1 B 69.9	A -2.10 B -5.06

Buffer: Na cacodylate (0.02 M) NaCl (0.08M), pH 6.63, 0.1 U.  
Av. D = 4.90 volts/cm.

\* Components: A = beta-casein, B = alpha-casein complex, C = dissociated fraction from alpha-casein complex.

TABLE 8  
*Analysis of cheese used in feeding tests at a 14% protein level.*

	Protein	Fat	Moisture	Ash
7-16 Control	25.9	31.1	38.4	4.24
7-17 Control	25.1	31.7	37.5	4.86
7-16 0.5% $\text{H}_2\text{O}_2$ —10 min.	23.5	28.9	42.9	3.95
7-17 0.5% $\text{H}_2\text{O}_2$ —10 min.	22.8	28.8	42.9	3.64
7-16 0.5% $\text{H}_2\text{O}_2$ —30 min.	23.0	28.6	43.2	4.01
7-17 0.5% $\text{H}_2\text{O}_2$ —30 min.	22.0	28.0	43.2	4.36

TABLE 9  
*Feeding trials with cheese furnishing 14% protein*

	Average initial weight	Average weight after 6 wk.	Average weekly weight gain	Average weekly feed consumption
Control, 7-16	63.2	259.9	32.8	116.8
Control, 7-17	63.1	256.7	32.3	119.3
$\text{H}_2\text{O}_2$ —10 min., 7-16	63.1	247.8	30.8	116.0
$\text{H}_2\text{O}_2$ —10 min., 7-17	63.2	241.1	29.6	110.9
$\text{H}_2\text{O}_2$ —30 min., 7-16	63.1	239.3	29.4	113.3
$\text{H}_2\text{O}_2$ —30 min., 7-17	63.1	246.2	30.5	119.3

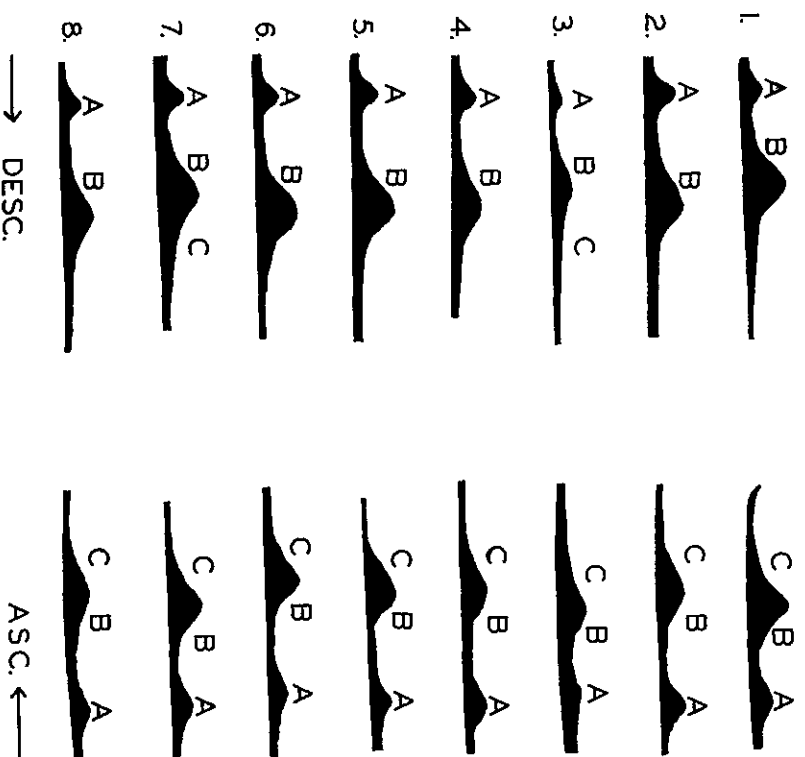


Fig. 1. Electrophoresis of proteins of cheeses made from milks treated with various levels of hydrogen peroxide. The sample treatments are given (Table 7).

and feed consumption, both among groups and within each group. The moderate difference in growth between control and experimental groups was apparently related to a slight difference in feed consumption.

#### CONCLUSIONS

Analytical values for milk, cheese, and whey samples were in good agreement with published values. In general, there was no effect of peroxide-catalase treatment of milk on levels of nutrients in the milk, or in cheese or whey obtained from that milk. Considering the data on a dry-weight basis, treatment of milk with 0.5% peroxide lowered the values for cystine and methionine in the cheese by from 10 to 25%.

Good protein efficiency ratios were obtained on all of the milk, cheese, and whey samples, and variation was within normal limits with one exception, in the case of the cheese made from 120° F. 0.5% peroxide-treated milk. However, the definite lowering of the protein efficiency ratio indicated in the first test on this sample was not confirmed in a repeat test on this particular sample.

Electrophoretic studies on proteins from the cheese samples showed only

minor differences, which did not appear to be directly related to the peroxide treatment.

The rat-feeding tests carried out on duplicate sets of cheese made from milk treated with 0.5% hydrogen peroxide for 10 and 30 min., and with the cheese furnishing 14% protein diet, showed only a slight difference in growth between control and experimental groups.

The results as a whole indicate no marked changes in the composition or nutritional value of milk treated with 0.1, 0.2, or 0.5% hydrogen peroxide under the conditions described, or in the cheese or whey obtained from that milk.

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