

Table 1. Fatty acid composition of lipids from different strains of *Kluyveromyces fragilis*.

Fatty acids ^a	Relative percentages							
	50-29 ^b	72-297	Y-1156	Y-1196	Y-108	Y-1171	50-16	C-106
12:0	27	20	1	15	17	2	1	1
14:0	6	4	6	4	2	5	5	7
16:0	29	34	31	40	40	38	25	36
? ^c	8	11	12	7	1	6	11	8
18:0	—	—	—	—	—	—	7	4
18:1	26	31	42	35	40	47	43	39
18:2	3	1	8	—	—	3	7	6

^aFatty acid methyl esters are designated by the number of carbon atoms to the left of the colon and the number of double bonds to the right.

^bThe numbers in this row indicate the identification number of the 8 strains of *K. fragilis*.

^cThe identity of this fatty acid was not determined because it did not appear to be related to the survival of the cultures.

Percentage of Yeast Cells and Whey Protein in Material Recovered From Whey Cultured with *Kluyveromyces fragilis*

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Lactose in cheese whey can be completely utilized by growing *Kluyveromyces fragilis* in the whey. Removal of the resulting yeast cells and heat precipitated whey protein leaves a liquid much more acceptable than the original whey for disposal in a municipal waste system.

The yeast and heat-precipitated whey protein recovered from cheese whey can be used as a food ingredient. Considerable interest has also been shown for its use as a supplement for animal feeds. To have better knowledge of the material for such use, it would be desirable to know the relative amounts of yeast cells and whey protein it contains.

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Unsupplemented cottage cheese whey was cultured with *K. fragilis* 1156 as described by Smith *et al.*, 1977. The process involved culturing 450 gal of whey from the University cottage cheese vat in a 1000-gal tank. After inoculation, the temperature was adjusted to 35°C and air was pumped through the system at approximately 90 gal per min. The inoculated whey was incubated at 35°C until the lactose was depleted. At this point steam was usually injected into the cultured whey until the temperature reached 95°C. By allowing it to remain undisturbed overnight in the tank, the heat precipitated whey protein and yeast cells settle to the bottom. The yeast-whey protein material can then be recovered as a sludge material or further drained and dried to provide a product containing 60 to 75 percent protein on a dry weight basis.

In order to determine the amount of yeast cells and whey proteins in the mixture, a sample was taken from the cultured whey just prior to the injection of steam. Measured portions of the cultured whey were centrifuged to remove the yeast cells. The supernatant fluid was heated 10 min at 95°C to precipitate the whey proteins. The whey proteins were recovered by centrifugation. The yeast cells and whey proteins thus recovered from the measured portion of cultured whey were dried in a forced air oven. They were cooled in a desiccator and weighed to determine the dry weight of yeast cells and dry weight of whey proteins. From this information we were able to calculate the percentage of whey protein and the percentage of yeast cells in the mixture. While there were some variations among batches, the dried material recovered from the cultured whey contained an average of 43 percent yeast cells and 57 percent whey protein.

Literature Cited

Smith, W. *et al.*, 1977. Okla. Agr. Exp. Sta. Misc. Publ. 101, p. 176.
