A TAXONOMIC STUDY OF SOME BACTERIA FOUND IN ICE CREAM

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In the Spring and Summer of 1936, the Dairy Department of the University of Illinois made a survey of the ice cream sold in the State of Illinois. Five hundred samples of ice cream were collected and analyzed for composition and bacterial content. The bacterial analyses of these samples will be considered in this paper.

A small amount of each sample of ice cream was put in a sterile half-pint milk bottle in order to obtain the total bacterial count. These bottles were allowed to stand in a warm room for a few minutes until the small portions of the ice creams melted. Then eleven grams of each sample of melted ice cream were weighed in bottles containing ninety-nine cc. of sterile water. This gave a dilution of one gram of ice cream to nine cc. of sterile water. Besides this, dilutions of one to nine, dilutions of one to a hundred, one to a thousand and one to ten thousand were made. Four media were used to determine coli. These media were eosine methylene-blue agar, red-violet bile agar, 2 per cent brilliant green fermentation tubes, and formate ricinoleate fermentation tubes. The last medium gave the highest number of positives for coli.

A table giving the total bacteria count for all the ice creams would be too large for this paper. The following summary will give an idea of the results secured. Thirty per cent of the samples of ice cream collected had a bacteria count of more than a million per gram. Seven per cent had a count between 1,000,000 and 500,000. Sixteen per cent had a count between 500,000 and 100,000. Seventeen per cent had a count between 100,000 and 50,000 and twenty per cent had less than fifty thousand. Then there was about six per cent which was not included in the above summary but they all had less than a hundred thousand bacteria per gram and most of them had less than fifty thousand. There were sixteen samples which had so many bacteria that the plates could not be counted at 10,000 dilution. Sixty per cent of all the ice creams examined showed the presence of the *coli aerogenes* group.

After the plates were counted, the predominant organisms on each plate were transferred to agar slants to be used for identification. No coli were used because their presence was shown by special media. The descriptive chart was used as the guide to determine the characteristics of these organisms. Most of the media used were prepared according to the formula given in the Manual for Pure Culture Study of Bacteria. Bergy's manual was used to determine the names of the organisms.

Before any attempt was made to classify an organism, it was first transferred to a fresh agar slant and allowed to grow for 48 hours. It was then inoculated into a tube of broth and incubated 24 hours and then it was inoculated into a second tube of broth and allowed to grow for another 24 hours. It was from this second tube of broth that the work of identification was started.

After one spends a few weeks classifying bacteria, he notices discrepancies in the manual. It also becomes apparent that some organisms will not check every time they are run through the pro-

cedure called for in the descriptive chart and sometimes when they do seem to check they will not exactly fit any description given in the manual. Some of the organisms reported in this paper were run ten times before satisfactory checks were obtained. It is evident that the classification of bacteria is not an exact science.

A list of the organisms so far classified is as follows:

GENUS	SPECIES
Micrococcus	*Viscosus*
"	*auranticocus*
"	*subcitrus*
"	*cosiolyticus*
"	*Mucofaciens*
"	*varicens*
"	*cereus*
"	*subflavescens*
"	*flavis*
"	*ureae*
"	*flavescens*
"	*subcitreus*
"	*luteus*
"	*luteolus*
"	*conglomeratus*
"	*chersonesia*
"	*Frindenneichii*
"	*candidus*
"	*saccatus*
Rhodococcus	*corallinus*
Clostridium	
Pseudomonas	*rugosa*
"	*putida*
"	*synayanea*
Aerobacter	*Levans*
"	*oxytocum*
"	*aerogenes (ropy)*
"	" *(not ropy)*
"	*hibernicum*
Sarcina	*lutia*
"	*Aurantiaca*
Proteus	
Achromobacter	*reticularium*
"	*Lipolyticum*
"	*Venosum*
"	*connii*
"	*viscosum*
"	*hyalinum*
"	*coaduncetum*
"	*heati*
"	*desmolyticum*
"	*fairmounteuse*
"	*putrifacteus*
"	*geniculatum*
"	*aromafaciens*
Flavobacterium	*aurescens*
"	*solere*
"	*aurcentium*
"	*lactis*
"	*Flavescens*
Bacillus	*pransuitzii*
"	*mesentericus*
"	*megatherium*
"	*cereus*
"	*sphaericus*
"	*Teres*
"	*vulgatus*
"	*amorus*
"	*Thermodiastaticus*
"	*graveoleus*
"	*Kaustophilus*
"	*Thermononliquefcoens*
"	*ruminatus*
"	*ablaciis*
"	*simplex*
"	*hessi*