

## NOTES ON MILK ADULTERATION

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The adulteration of milk with remade milk has been performed lately on a large scale in all civilized countries. It is one of the most difficult problems that faces the competent chemist in the routine work of food analysis. As the adulterant is a similar biological substance, differing only slightly in its chemical constituents, it can not be tested by the well-known biological reactions (precipitin test).

The percentage of adulteration in Porto Rico for the 21-year period covering from 1901 to 1922 ran generally from 20 to 25 per cent. Since then the figures apparently have been decreasing slowly as follows:

1923-24	14 per cent
1924-25	11 per cent
1925-26	10 per cent
1926-27	8 per cent
1927-28	6 per cent

It is possible that these latter figures are more apparent than real, due to the fact that the experienced adulterators have been camouflaging the presence of added water by using remade milk as the most safe adulterant. By these means, the total solids, mineral matter and index of refraction of the cooper serum were kept within the official standard. The ratio of fat to casein was of no use in detecting the adulteration with skimmed remade milk below 20 per cent. The Evenson method came to our rescue, but we discovered very soon after, that anything below 10 per cent of remade milk was very hard to discover. We must keep in mind that boiled milk, and even pasteurized milk, give a weak reaction. We are developing a method that shows as low as 1 per cent of remade milk (if prepared with skimmed-milk powder or 5 per cent of remade milk (if made of whole-milk powder).

Abourth three-fourths of the total work rendered in the Chemical Laboratory of the Health Department is performed on milk samples, as may be seen by the following table:

## Analytical Work Performed During February, March and April, 1929.

Kind of examination	Feb.	March	April
Total number of samples of all kinds .....	414	529	576
Total number of samples of milk .....	320	443	494
Pure samples of milk (including excellent, good, fair and inferior samples) .....	254	358	434
Adulterated samples .....	43	48	43
Suspicious samples .....	21	21	6
Samples for original research .....	2	16	11
Percentage of adulteration in the entire island..	13.4%	10.8%	8.7%
Percentage of adulteration in San Juan, San- turce, Río Piedras and Trujillo Alto (*) .....	5.%	6%	3.5%

\* In these four municipalities where most of the remade milk is prepared a vigorous campaign was carried on to discover and report all violations.

Within a short time we will present a preliminary report and soon thereafter an article will appear with the complete analytical data covering all phases of the problem.