Table 1. ANTIBIOTICS PRODUCED BY ONE STRAIN OF *Str. lactis*

Year of freeze-drying	Average titre against *Str. agalactiæ* in Broth	Broth + 5 per cent serum	Ratio of activity in broth/serum
1944	1/ 83	1/45	1·8
1945	1/101	1/55	1·8
1947	1/125	1/49	2·5
1948	1/220	1/41·5	4·5
1949	1/492	1/53	9·3

removed these apparent differences, and the activities were then much the same.

Comparisons were then made between commercial and laboratory nisin preparations. The times required to kill 50 per cent of the organisms in a culture of *Strep. agalactiæ* in broth and in broth containing 5 per cent serum were determined[2]. A 'crystalline' commercial preparation (preparation *A*) was compared with a cruder nisin made from the culture dried in 1944 (preparation *L*). For preparation *A* to effect a 50 per cent kill in the presence of serum the time was increased by 264 per cent, but for preparation *L* by only 191 per cent. Similar results were found in the presence of milk. *Strep. dysgalactiæ*, previously reported resistant to nisin[1b], also behaved differently in that, turbidimetrically, 50 per cent inhibition of growth was obtained by 10–12 units/ml. of the commercial preparation *A*, but 65 units/ml. of the cruder preparation *L* were needed for the same result.

Counter-current distribution, using 100 extractions and only one pair of solvents, failed to distinguish preparations *A* and *L*. Another commercial nisin preparation (*B*) was found, using 200 extractions, to consist of two fractions, both of which were distinguishable from *A* and *L*[3].

The activity of these preparations was further tested using two of the nisin-producing strains as test-organisms (Table 2). The concentration of nisin required to give a 20 per cent inhibition of growth was measured turbidimetrically. Preparation *B* was markedly different from *A* and *L*.

Preparations *A* and *L*, which could not be differentiated from each other in the counter-current process, were readily distinguishable in this biological test.

Table 2. DIFFERENTIATION OF NISIN PREPARATIONS

Nisin preparation		Units/ml. nisin required to give 20 per cent inhibition of strain dried in 1944	1949
Commercial *A*		298	1547
Commercial *B*	Fraction 1	303	823
	Fraction 2	155	422
Laboratory *L*		613	1030

It is now known that similar but not identical antibiotics are produced by various types of *Strep. lactis*[4]. The above results suggest that even the same strain can produce several antibiotics.

A. HIRSCH
National Institute for Research in Dairying,
Shinfield, Nr. Reading.
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Uptake of Lanthanum by a Yeast

IN the course of studies of the barium metabolism of larval *Drosophila* which it is planned to report in full elsewhere, we have found that larvæ on a medium containing barium-140 showed lanthanum-140 enrichment if the medium had been inoculated with Texas *Y*-2 strain of yeast[1] twenty-four hours before adding the larvæ, but barium-140 enrichment if the larvæ had been placed directly on the sterile food. These enrichments were measured by means of deviations in the shape of the curves of radioactive decay for the chain $^{140}Ba \rightarrow {}^{140}La \rightarrow {}^{140}Ce$, as has been clearly described[2] for the strontium-90–yttrium-90 chain. The observation appeared explicable on the assumption that the yeast cells were selecting lanthanum from the medium, while the larvæ, though preferring to feed on yeast cells, preferentially absorb barium.

To explore this possibility the yeasts were grown in shake-cultures on two media, one the fluid version of yeast beef broth agar[3] and the other Kalmus's[4] *Drosophila* medium modified by omission of agar, and substitution on a molar basis of propionic acid for half the tartaric acid. To each medium, carrier-free barium-140–lanthanum-140, in radioactive equilibrium, was added, and a drop of live yeast suspension.

Cells taken after 2, 4, 6, 24 and 72 hr. from both media, and washed once with non-radioactive medium, showed striking lanthanum enrichments, the decay curves of those from beef broth corresponding to six parts lanthanum-140 plus four parts barium-140–lanthanum-140 equilibrium, while those from the Kalmus medium corresponded to 9 parts lanthanum-140 plus 1 part barium-140–lanthanum-140 equilibrium. On the latter medium, growth was very slight. In one set of samples which were washed four times, it was found that the radioactivity of the fourth wash solution indicated barium to be removed slightly more easily than lanthanum.

Other experiments, still in progress, indicate that a fraction of both isotopes is retained even after twenty-four hours growth in clean medium, and that in the case of lanthanum this fraction is only slightly reduced by the presence, in the clean medium, of stable lanthanum acetate at concentrations of 0·36–0·72 millimolar.

Analytical studies by Richards and Troutman[5] indicated lanthanum accumulation by *Saccharomyces cerevisiæ*. Texas *Y*-2 is reported[6] as having been tentatively identified as a non-pathogenic form of *Candida albicans*. It appears that lanthanum uptake may be a common property of yeast growth, and experiments are now in progress to ascertain how far this property may be used as a tool in exploring the biochemical properties of the lanthanides.

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V. T. BOWEN
ANN C. RUBINSON

Biology Department,
Brookhaven National Laboratory,
Upton, L.I., N.Y.

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