

oxidation of reduced diphosphopyridine nucleotide under anaerobic conditions, for example, α -glycerophosphate dehydrogenase. It must be assumed that, in organisms which are capable of a homolactic fermentation, and which also possess the pyruvate dismutation system—for example, *S. faecalis*—pyruvate combines preferentially with lactic dehydrogenase. A number of explanations are possible for the different behaviour of *S. faecalis* and *A. mycoides*, such as the relative affinities of pyruvic oxidase and lactic dehydrogenase for pyruvate; the relative concentrations of the enzymes; or differences in macromolecular organization within the cells. The last possibility is plausible, since cells of *A. mycoides* treated by freezing and thawing are capable of a slow glucose fermentation, and the rate of the pyruvate dismutation reaction is considerably decreased by freezing and thawing.

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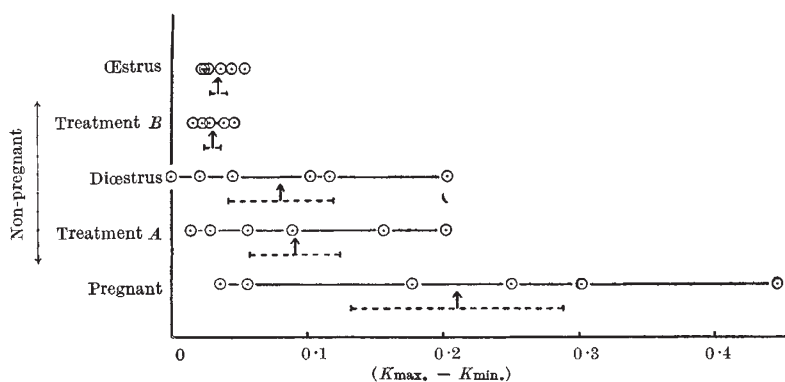
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Ultra-Violet Absorption Spectra and Flow Birefringence of Bovine Cervical Secretions

SECRETIONS were collected from around the bovine cervical os using a vaginal speculum and spatula. (It would have been better to use secretions taken from the cervix itself; but such samples were too small for the technique available.) All samples were then reduced to a constant solid content of 0.14 per cent by dispersing in water and clearing in a centrifuge for one hour at about 7,000 *g*. Absorption curves, determined between 200 and 400 $m\mu$, in general showed a maximum at about 273 $m\mu$ and a minimum at about 259 $m\mu$.

In view of relationships recently found¹ between the flow properties of these secretions and physiological conditions, the first aim of the present work was to look for similar relationships with the absorption curves. Samples from normal animals during the oestrous cycle and in pregnancy were examined, and also similar types of secretion found in a few heifers already undergoing treatment with mixtures of oestrogen and progesterone. Measurements of the difference between the extinction coefficients at the maximum and at the minimum were taken. This quantity was considered to be more characteristic of the sample than the dimensionless ratio of the two extinction coefficients, since it is less dependent upon scattering and 'general absorption'. Since it has not



K_{max} and K_{min} : extinction coefficients at the maxima and minima on the absorption curves. Arrows represent average values. Broken lines represent standard deviations. Hormone treatment A: implants of tablets 30 \times 100 mgm. progesterone; 15 \times 100 mgm. stilbœstrol. Hormone treatment B: injections of 70 mgm. progesterone, 0.5 mgm. hexœstrol per day

yet proved possible always to obtain optically clear samples, results showing particularly high 'general absorption' were discarded. The accompanying figure gives a summary of preliminary results on twenty-nine animals.

In the figure, distinct differences in the average values and distributions of $K_{max}-K_{min}$ are shown for the oestrous, diœstrous and pregnant types of secretion. Samples from animals in oestrus and which are also under treatment B are almost indistinguishable from those in natural oestrus; and secretions from animals undergoing treatment A group themselves between the diœstrous and pregnant samples. With the few animals tested so far, no relation has been found between the values of $K_{max}-K_{min}$ and the duration of pregnancy.

Due to some imperfection in the prism, the slit was open too wide at short wave-lengths. Presumably as a result of scattering, a region of apparent total absorption often appeared at about 215–235 $m\mu$. It was noticed that the width of this region was likewise a function of the physiological condition of the animal, but it is not yet known what physical properties of the secretions this scattering is representing.

Through the courtesy of Dr. A. G. Ogston, I have been able to examine a few similarly prepared samples in his concentric-cylinder flow-birefringence apparatus². Six samples from cows in oestrus showed no sign of birefringence. Of four diœstrous samples, three showed measurable angles of isocline. Six samples from pregnant animals all showed measurable angles.

No attempt has yet been made to interpret these results in terms of the molecular components of secretions; further work is in progress.

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