

20th. June 1950.

Dear Blaxter,

- (a) Genetical improvement of dairy cattle means an increasing average efficiency of the livestock available for the production (primarily) of milk.
- (b) The efficiency of each genotype must be measured in conditions of management (within the general framework of existing farm practice) most favourable to its efficiency, as measured by the economical production of milk.
- (c) An important element of the controllable environment consists in the quantity of nutrients supplied during lactation.
- (d) It would therefore be important to be able to measure the efficiency of a given animal when given approximately the "right" or best quantity of food. Previous nutritional studies seem not to have been directed towards this end, which derives its importance from the need to recognise better or worse potential performance.

An experiment is proposed to discover what difficulties are encountered, and, so far as these can be overcome, to compare a group of heifers in their first lactation; it will obviously be of importance, as in every quantitative determination, to ascertain the precision with which the measurement can be made, and to locate the circumstances which limit its precision.

As this statement does not closely cohere with yours, I add a few notes on the latter.

- (a) May be so. Such steps may perhaps reduce the price per gallon of production. Such presumably is also subject to the law of diminishing returns, and can only give a limited benefit relative to current practice.
- (b) This also is not one of my notions. I have no reason to think that the effect of improving stock would be small.
- (c) I do not think that improvement of environment (meaning not necessarily more expensive maintenance, but finding the most efficient method of management) would be exclusive of improvement in stock, even if there were no important interactions. There certainly are such interactions, however.
- (d) I do not believe (d); but it is impossible to determine the average performance of a given genotype, as we have no pure lines.
- (2a) Seems correct if the "chosen" environment is not taken to mean one chosen voluntarily by the cow, but one ascertained, so far as may be, from the cow's nutritional reactions.
- (2b) I have not checked that Wiener says anything relevant to the problem; there is, however, a general analogy.
- (2c) The second sentence is unnecessary; it is too vague to mean much.

Yours sincerely,