

**REPORT ON DAIRY INVESTIGATIONS
AT OFFERTON HALL, COUNTY
DURHAM, AND IN THE NORTH OF
ENGLAND, INCLUDING REPRINTED
OF OFFERTON BULLETINS, NOS.1-3.**

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UNIV. OF
CALIFORNIA

DURHAM COUNTY COUNCIL.

EDUCATION COMMITTEE.

REPORTS

ON

DAIRY INVESTIGATIONS

AT

OFFERTON HALL, COUNTY DURHAM,

AND IN THE NORTH OF ENGLAND,

INCLUDING REPRINTS OF OFFERTON BULLETINS, NOS. 1-3.

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INTRODUCTION.

Dairy Investigations in County Durham and the North-East of England.

The Agricultural Department of Armstrong College, Newcastle-upon-Tyne, commenced an inquiry into the variations in the composition of milk at the beginning of 1903. The first tests were made at the request of the Northumberland and Durham Dairy Farmers' Association, and these were elaborated at the instigation of the Northumberland County Council, which desired that some reliable information on the subject should be placed before the dairy farmers of that County.

It was soon felt, however, to be desirable that work of a more permanent character should be carried out; and, as the Northumberland station at Cockle Park is mainly engaged in work connected with farm crops and the rearing and feeding of live stock, the authorities of Armstrong College submitted a scheme for experiments in dairy work to the Durham County Council. This scheme was accepted, and as a result the work is now being done at Offerton Hall, about 3 miles from Sunderland. This farm is about 580 acres in extent, 165 acres of which are pasture, and there is a herd of 50 dairy cows. By arrangement with Mr. James McLaren, the tenant of the farm, the College authorities may at any time select 10 cows for an experiment, and place them in a separate cow-house, while experiments in calf-rearing may also be undertaken. A laboratory and a weigh-bridge have been provided.

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Mr. James McLaren, junior, a former student of the College, supervises the experiments, such as weighing out the rations and the feeding and weighing of the cows, and carries out the milk testing. The College was fortunate in securing the ready co-operation of Mr. McLaren and his son, to both of whom the success of the work is largely due.

This pamphlet contains:—Reprints of the first report issued by the College in 1903 on variations in the composition of milk; reprints of Offerton Bulletins, Nos. 1 to 3; soya cake for milch cows; a reprint of a report of experiments with the milk of newly calved cows at Offerton; the composition and manurial value of foods; daily rations for fattening cattle and milch cows; calf rearing at Newton Rigg; prevention of tuberculosis by open-air treatment; and tests for farmers' milk.

These reprints and articles have been prepared at the request of the Durham Education Committee, for the use of dairy farmers in the county, as most of the reports are now out of print, and there is a great demand for them.

In preparing for publication a considerable amount of matter which was not included in the original reports has been added.

These dairy investigations have aroused great interest, not only in the County of Durham, but throughout the North of England, and in the country generally. The County of Durham has, by the grant which has enabled the College to establish the Offerton Hall Dairy Research Station, made the College scheme of Agriculture Research more complete, and that this work is appreciated by dairy farmers is evident from the great interest taken in it by the Northumberland and Durham Dairy Farmers' Association, and other similar bodies, and also from the large number of inquiries made to the College by dairy farmers and by all interested in dairying.

Offerton Bulletins 1 and 2 were written by Professor C. Bryner Jones, M.Sc., now of the University College of Wales,

Aberystwyth, when Lecturer in Agriculture in this College, while *Offerton Bulletin 3* was written by Mr. Frank P. Walker, B.Sc., the present Lecturer in Agriculture, who, with myself, is responsible for the planning and conduct of the experiments, the details being under his charge. A large amount of the work has been done by Mr. S. H. Collins, M.Sc., Lecturer in Agricultural Chemistry in this College. Mr. W. T. Lawrence, Manager of the Cumberland and Westmorland Farm School at Newton Rigg, has most kindly contributed an article giving the results of his valuable experiments on calf rearing and feeding, and Mr. Nichol, Bradford, near Belford, has kindly allowed an account of his method of rearing calves in the open air to be inserted. My assistant, Mr. T. R. Ferris, B.Sc., has also given considerable assistance, especially in preparing many of the tables.

The College authorities have had the advice and assistance of the Advisory Agricultural Committee of the Durham Education Committee in the conduct of this work, the present members of which are:—Wm. Fleming, Esq. (Chairman), Alderman W. A. Weightman, Councillor G. Davison, Thos. Davis, Esq., W. Parlour, Esq., R. Richardson, Esq., W. L. Walker, Esq., J. A. L. Robson, Esq. (Secretary). Alderman Weightman, one of the largest and most successful dairy farmers in Durham, has been especially helpful in this work.

Liability of milk to be under standard.—The Board of Agriculture regulations for milk are that it must contain not less than 3 per cent. of fat and 8·5 per cent. of solids not fat. It is presumed that milk is not genuine when under these standards, and that it has been tampered with, either by the extraction of milk-fat (cream), or by the addition of water, *until the contrary is proved*.

The Board also issued a circular in December, 1901, in which they state that although genuine milk is usually well above the standards, it may occasionally, especially in certain seasons of the year, fall below these limits. They suggest in

such cases, that, in the absence of special circumstances indicating fraud, the local authority might in the first instance call the vendor's attention to the analyst's report and ask him if he has an explanation to offer. If this were satisfactory, they might at their discretion refrain from proceedings. They suggest, however, that further samples of milk should be taken in such cases, so that a satisfactory conclusion can be reached.

In the Offerton reports which follow, it will be seen that the mixed milk of five cows was very frequently under the 3 per cent. standard of fat, especially in the morning's milkings, and that it was also occasionally under the 8.5 per cent. of solids not fat. The last three lines of the twenty tables dealing with the average percentages of fat and solids not fat should be consulted for this purpose.

The organization of this work has been of special interest to myself, as the practical and scientific sides of dairy farming have always occupied a large part of my attention.

DOUGLAS A. GILCHRIST,

Professor of Agriculture.

ARMSTRONG COLLEGE, NEWCASTLE-UPON-TYNE,

November, 1909.

Variations in the Composition of Milk and their Probable Causes.

Published December, 1903.

BY DOUGLAS A. GILCHRIST.

An inquiry into the variations in the composition of milk by the Agricultural Department of the Durham College of Science* has been in progress since January 1st, 1903. At the request of the Northumberland County Council, the College undertook to make these investigations of a more thorough character, and to extend this work in that county.

A large number of samples of milk of individual cows and of mixed milk have been collected from different farms, and the amounts of butter fat and of solids not fat contained therein have been estimated. The breed of the cows, the times of milking, the weather conditions, the temperature outside and inside the cowsheds, and the daily rations fed to the cows, have all been noted. Mr. James McLaren, Offerton Hall, and Mr. Charles Marshall, Broomhaugh, both placed their herds at the disposal of the College, and samples of milk from individual cows and from the mixed milk of these herds have been taken fortnightly and tested at the College. Samples have also been taken and tested from cows on the Duke of Northumberland's Home Farm, Alnwick, and from the herd of Mr. J. Swann, Lookout Farm, Seaton Delaval. As changes in the composition of milk of individual cows occur very quickly, the milk of one cow has been regularly tested at Cockle Park during the greater part of 1903, so that their extent might be noted.

* Now Armstrong College.