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EFFICIENCY IN PRODUCTION OF BUTTER

being

AN INVESTIGATION INTO CERTAIN FACTORS AFFECTING THE
ECONOMIC ASPECTS OF TECHNICAL EFFICIENCY OF BUTTER
FATORIES OPERATING IN NEW ZEALAND, WITH SPECIAL
REFERENCE TO THE 1949/50 SEASON

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PREFACE.

New Zealand's economy is dependent on dairying as a source of national income to a very marked degree, for more than one-third of the country's total export income is derived from this source. Of the total whole milk produced "at the pail" in the 1952-53 season, over 68 per cent was manufactured into creamery butter, yielding 200,000 tons. A revenue in excess of £52,000,000 was derived from this butter.

A processing industry of this magnitude and importance merits close attention. Although much time and research have been devoted to technical manufacturing problems, very little analytical work has been conducted in New Zealand on the economic aspect of efficiency in dairy processing industry. Although data are available in the form of reports, compiled statistics and articles, they are descriptive in character, or mere compilations. As such they fail in the important task of analysis of the conditions they describe.

It seems strange that in a country like New Zealand where the standard of scientific research is so high and where the dairy industry contributes so much to the national economy, that so little is known of the economic aspects of the dairy industry. Apart from TASKER's two papers* the amount of analytical research is almost nil. The valuable information compiled by the New Zealand Dairy Board is largely descriptive and statistical and does not throw light upon the problems as investigated by research workers in this field overseas.⁺

For example, we in this country, do not know the total costs of refrigeration, or steam production, or power used in factories. Nor do we know how much coal or units of electricity are consumed. From the standardised accounts^o in current use we can tell the total cost of actual coal or heating agents used, but we do not know the cost of the labour appropriated to steam used, or any of the other capital or administration costs chargeable to refrigeration or steam power.

* TASKER, J.F. (1938): The Cost and Capitalization of North Auckland creameries during 1935-36. The Accountants' J. (August)
 — New Zealand Creamery Costs and Pay-outs for the 1937-38 Season. N.Z.Jnl. of Science and Technology, Vol. 26. No.4 (Sec. A), pp. 204-213, 1944.

⁺ See Appendix A: "Related Studies".

^o See Appendix B:- "Form of Standardized Accounts used in the Butter Industry".

Nor do we know the costs of the various processes in butter production. What is the cost of reception on the stage, the cream processing costs, the cost of packing, storage and disposal? Frankly we just don't know, because our system of standardized accounts does not permit this important analysis. Our standardized system does advise total manufacturing charges, factory overheads, on-board charges and general overheads etc., which, together with cream collection costs disclose the total costs of butter manufactured. But the system fails to disclose the cost of each stage or process in production.

Apart from one company, it is doubtful whether any company can advise process costs without considerable investigation or delay. In most cases the minimum of detail is kept. Sufficient records are maintained to satisfy the requirements of the standardized accounts together with the statistical information required to be shown, also for statutory returns and for monthly reports at directors' meetings. But very few companies are able to advise the annual consumption of coal or units of electricity. It is rare to find a company that can advise the monthly consumption of heating agents. It is true that this information is needed for statutory returns, but many a manager confessed that too much reliance should not be placed on the figure submitted in the return as often it was an estimate or approximation. Less than ten per cent of companies are able to advise annual figures with any degree of confidence as to their accuracy.

Thus in the industry we do not know the tons of coal used per ton of butter made. Nor do we know the units of electricity per ton of butter, or the number of gallons of petrol per ton-mile in cream collection, or the man-hours or labour per ton of butter. In brief, we lack vital information which is basic in measuring the economic aspects of technical efficiency.

This lack of information could be multiplied. We do not know the percentage of cream hauled by operators employed by the factories, by outside contractors; or by road or rail. We do not know the average distance of cream suppliers from the factories. What percentage of cream comes from within a five-mile radius, or a ten-mile radius? What is the cost of hauling cream in terms of distance, weight or time? What is the most efficient size of lorry? Should three-tonners, five-tonners or heavy articulators be

used in cream collection? At what point do cream collection costs double or treble or become quite uneconomic? What percentage of suppliers average under 5 lbs. of cream per collection-day or 10 lbs. or 100 lbs. etc.? These are elementary questions when efficiency is to be examined, and it has to be admitted that the answers are not known.

It is partly the purpose of this study to make a pioneering attempt to furnish answers to some of these questions, or to indicate the limitations or boundaries under which such research could be conducted.

While many of these questions are technical in character, they are considered sufficiently important to merit close examination, for technical efficiency underlies economic efficiency as an important determinant.

It should be added that much confidential information was made available on the explicit understanding that the identity of individual companies would not be disclosed. This injunction has been followed out carefully, and in many cases, the pattern of grouping data has been varied slightly to achieve this end.

It should be pointed out that when this research was planned, it was directed that the work should draw upon two disciplines or faculties, viz. Dairy Manufactures and Economics, so that in addition to being an academic appraisal, the thesis should be of value as a reference work on certain technical aspects of interest to the industry.

It has not been easy to achieve these dual aims, for in parts the economic content has had to be preceded by considerable discussion of technical aspects of butter manufacture. To minimise this, certain purely technical aspects have now been relegated to the Appendices. (1958)

ACKNOWLEDGEMENTS

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