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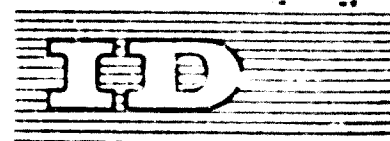
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to the Problems of Preservation and Refrigeration  
of Food in Developing Countries

Vienna, Austria, 24 - 27 February 1969

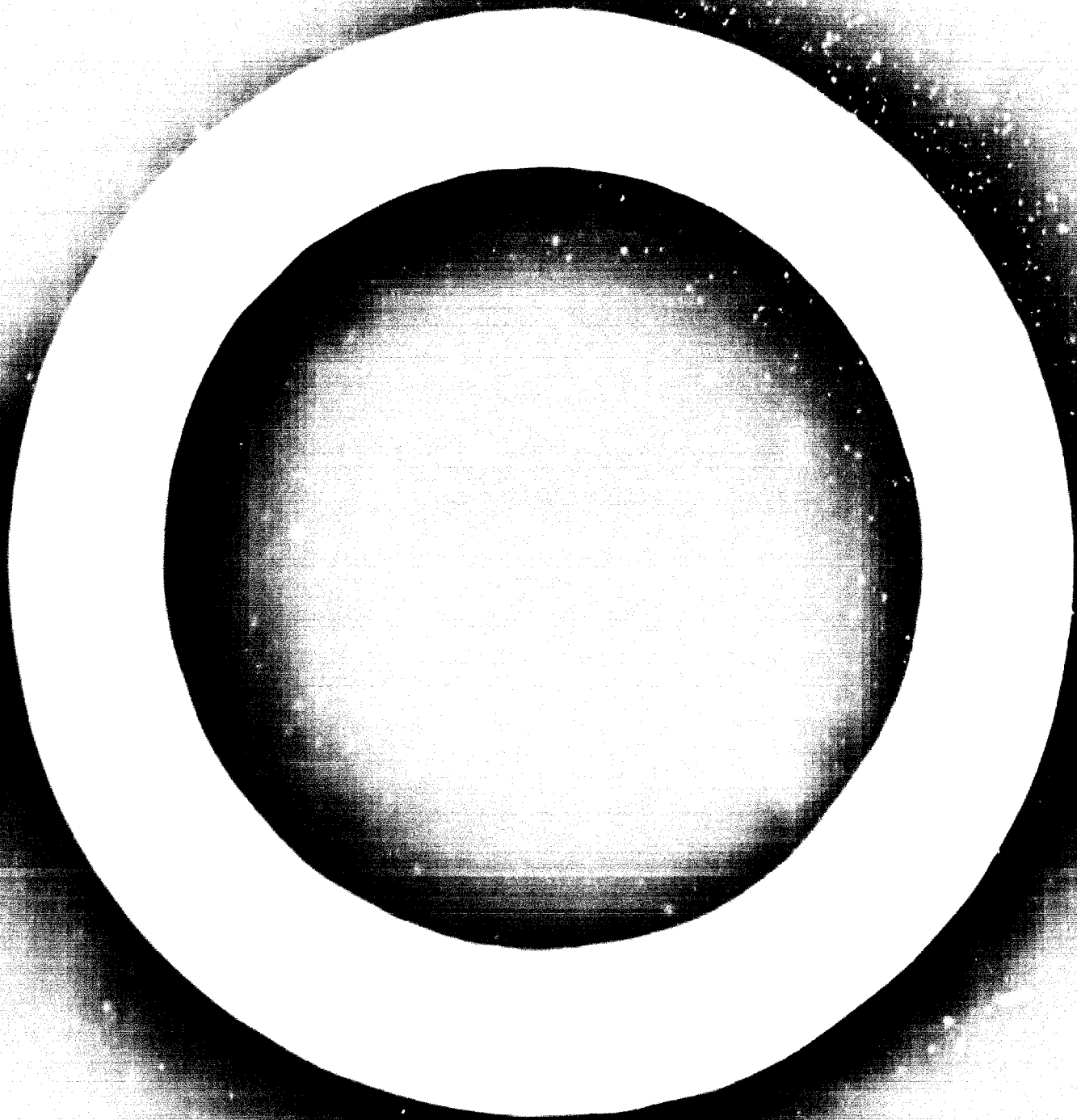
PROBLEMS OF THE USE OF REFRIGERATED AND  
PRESERVED FOODS IN DEVELOPING COUNTRIES

by

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The developing countries have the common characteristic features of low purchasing power, low standard of living and low agricultural, industrial or commercial organization. Consequently, any device which leads to increased cost of living, though desirable otherwise, is usually frowned at. One very fundamental problem which has emerged during the last decade or so of industrial development in Nigeria is the relatively higher unit cost of production. For example, electricity costs at least 10 times more than in Europe, also packaging materials cost in some cases up to 40% of the product. It has therefore become obligatory to impose stringent custom barriers to protect home industries. On the other hand, fantastic food losses occur in the warm humid weather as a result of poor storage, very little processing and inadequate distribution. As much as 75% loss has been recorded for fruits and vegetables, 20%-40% for root crops and 5%-10% for grains and pulses with an estimated cash value of over \$200M annually.

#### Refrigeration of meat

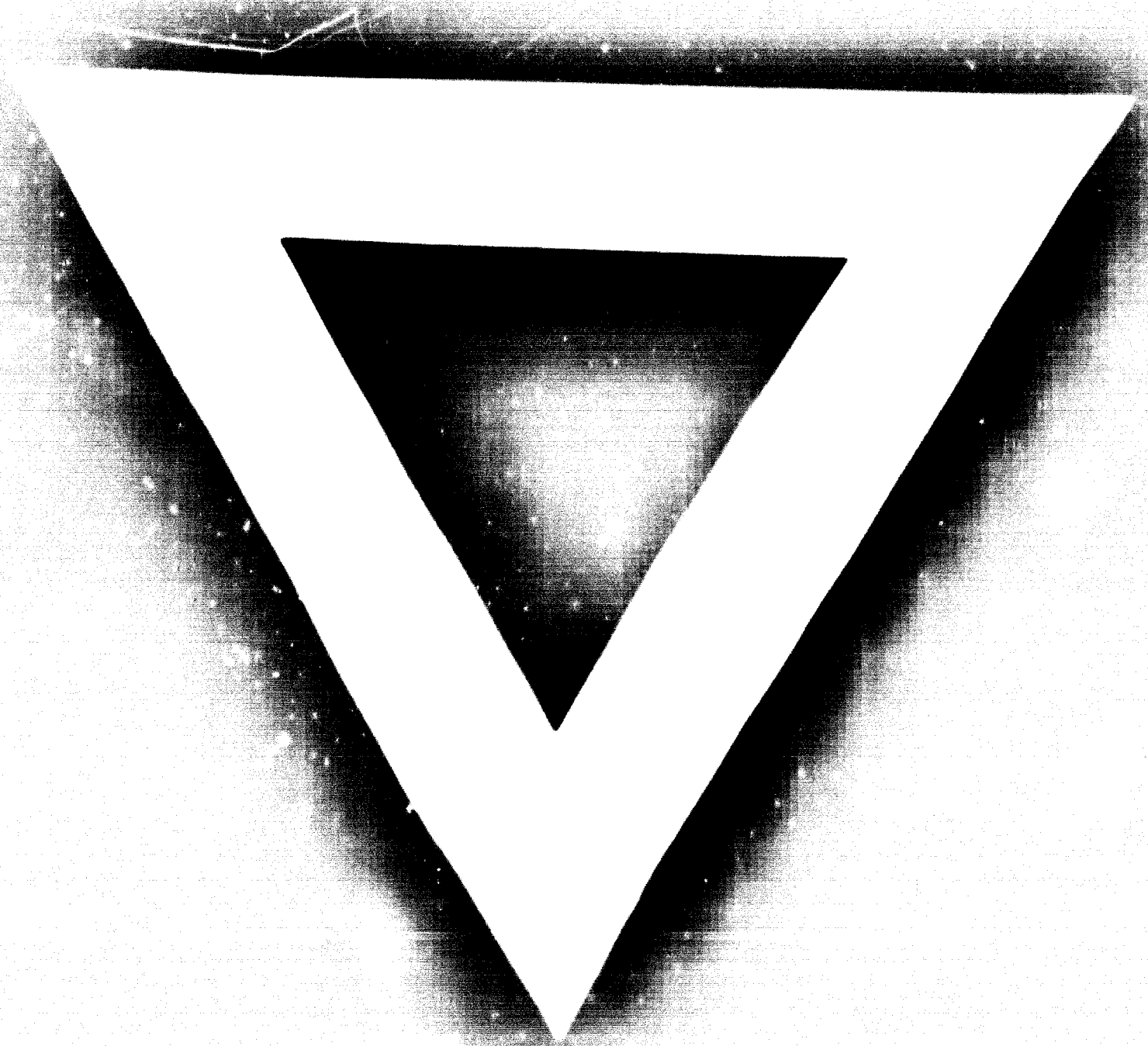
Recently an abattoir was established in Nigeria and was faced with the problem competing with the traditional meat market. The industry was faced with the problem of slaughtering meat for sale in markets that are located hundreds of miles away. It could afford to refrigerate the meat up till delivery in the markets but thereafter could not economically maintain refrigeration conditions without conceding a price differential. It therefore decided to market under local conditions. The public health hazard involved in this decision is that the spectrum of pathogenic micro-organisms which are normally present in traditionally slaughtered meat under the ambient temperature of about 30°C will now be extended to include those thriving under much cooler conditions notably Clostridium sp. This could negate the objective of processing.

#### Protein enrichment of food

A major factor responsible for the increasing rejection of the use of high protein foods in the developing countries is the bizarre approach to their production and utilization. In many cases, the cause of integrating the food into the normal meal cycle or dietary pattern is left with the consumer, whilst on the other hand, the product is offered in a form and flavour not known to the recipients. The enrichment of gari in Nigeria is a case in point.

The physical addition of protein concentrates to gari has been found to be ineffective because when the blended product is prepared into a meal in the traditional way, adding into cold or hot water, the gari granules sink whilst the protein concentrate floats and thus are separated. In order to achieve homogeneity in physical form and flavour, it is now considered fundamental to fortify foods somewhere along the process line.





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