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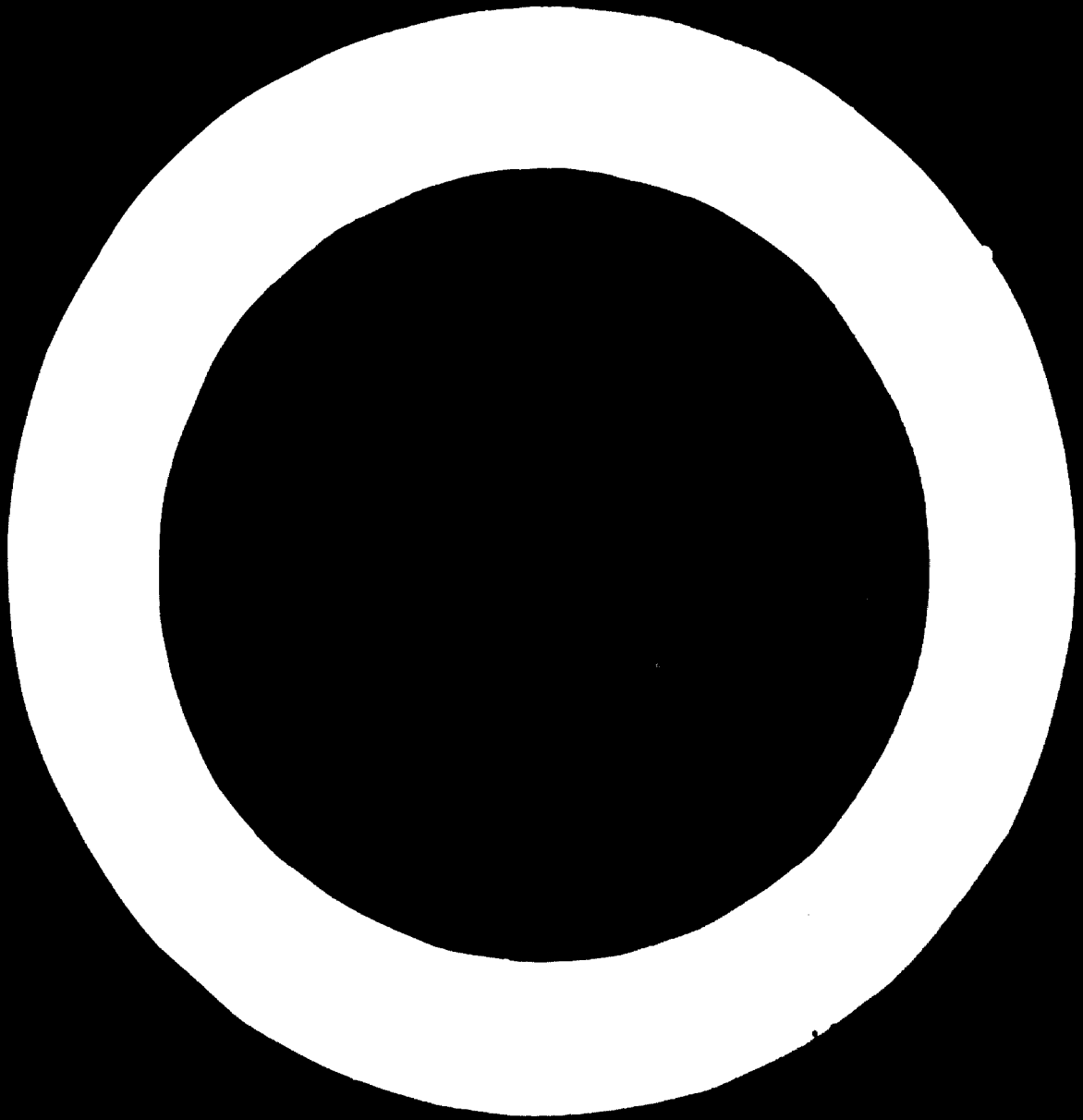
**THE REGIONAL
CONSULTATION
ON PROMOTIONAL
AND
TECHNICAL ASPECTS
OF PROCESSING
AND
PACKAGING FOODS
FOR EXPORT**

Report of a Consultation

Casablanca, Morocco

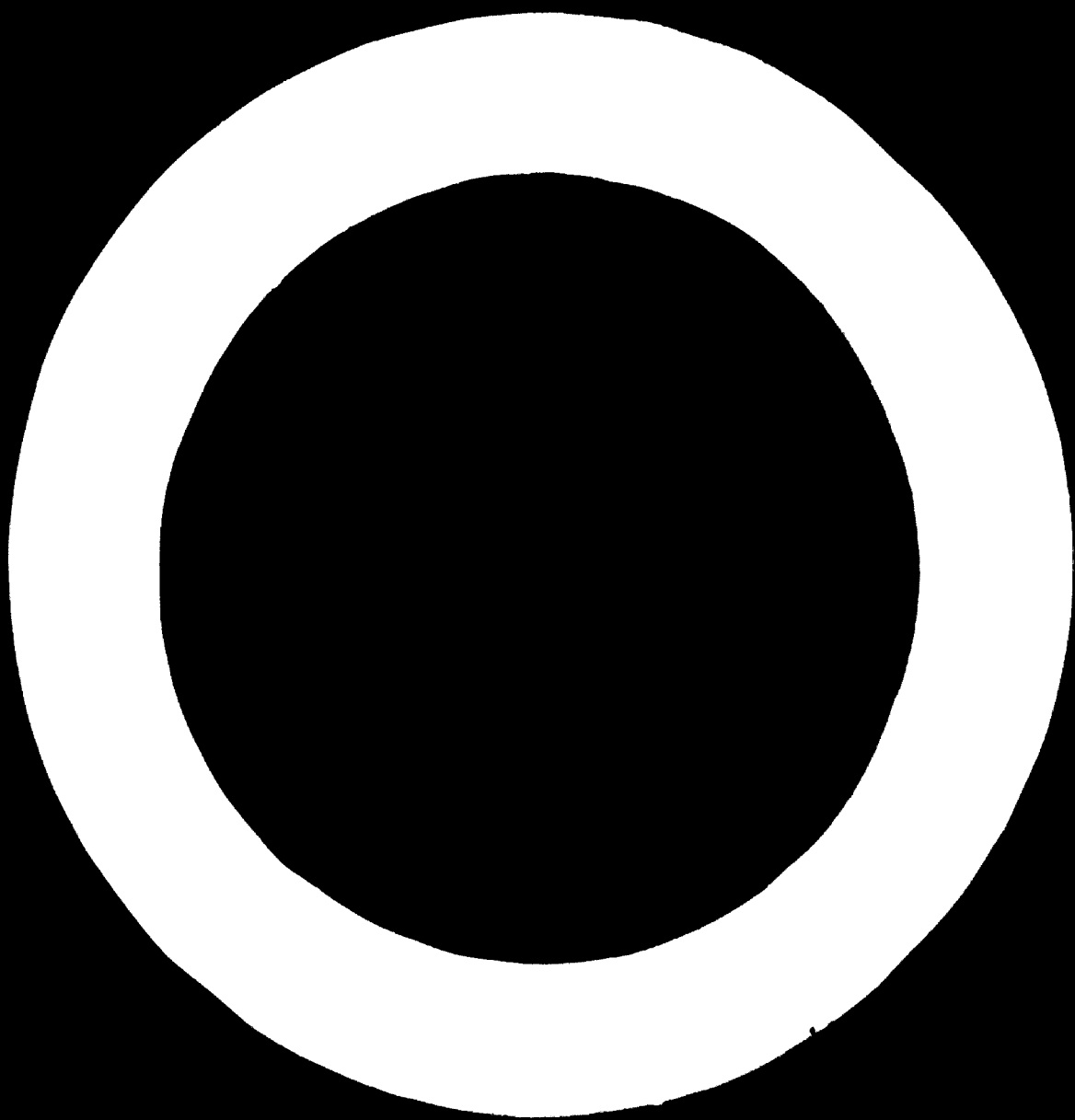
23 - 28 June 1974

We regret that some of the pages in the microfiche copy of this report may not be up to the proper legibility standards, even though the best possible copy was used for preparing the master fiche.



CONTENTS

<u>Chapter</u>		<u>Page</u>
	INTRODUCTION	5
	RECOMMENDATIONS	6
I.	ORGANIZATION OF THE CONSULTATION	8
II.	SUMMARY OF THE DISCUSSION	9
	Development of the food industry and export promotion	9
	Fruit and vegetable processing	10
	Fish processing	13
	Meat processing	16
Annex	List of documents	19



INTRODUCTION

The Regional Consultation on Promotional and Technical Aspects of Processing and Packaging Foods for Export was held at Casablanca, Morocco, from 23 to 28 June 1974. The meeting was organized jointly by the United Nations Industrial Development Organization (UNIDO) and the Government of Morocco, through its Office de Commercialisation et d'Exportation (OCE).

The purpose of the meeting was to bring together individuals from developing and developed countries to discuss the problems associated with the promotion of production and export of processed foods from various African countries and to formulate recommendations that might contribute to the accelerated development of the food-processing industry of Africa. Discussions of the technological and economic aspects of the industry, including the promotion of co-operation among developing countries, were complemented by plant visits to factories at Marrakech, Larache, Meknes and Safi. The food fair, in which 13 exhibitors from industrialized countries and 8 from African countries participated, granted the participants an opportunity to display raw materials, processed foods and equipment and to discuss investment possibilities.

RECOMMENDATIONS

At the closing session of the Consultation on 28 June 1974, the recommendations, which had been formulated and variously amended by the participants, were unanimously approved.

General

It was recommended that:

- (1) UNIDO organize such meetings in Africa on a regular basis, preferably every two years;
- (2) The industrialized countries give the technical personnel in food industries in Africa an opportunity to receive in-plant training in the factories of the manufacturers and that UNIDO be requested to initiate this programme; that training centres with emphasis on practical training be established; and that in-plant training programmes be organized in Africa;
- (3) An organization be established for the canning industry in Africa to include representatives of the central authorities and the manufacturers in order to initiate and develop a study programme regarding the technical aspects of canning and to give technical advisory services to the manufacturers as appropriate.

Fruits and vegetables

It was recommended that:

- (1) The authorities resolve by means of policy decisions the conflict arising in certain African countries as a result of the temptation to export fresh fruit that could otherwise be used as raw material for local processing;
- (2) Negotiations be initiated between industrialized countries and those African countries with citrus-production potential to elaborate a co-operative programme for the establishment of citrus-processing industries, which would be a further step towards the establishment of an equitable division of labour for industrial production;
- (3) Companies in the industrialized countries producing processed fruit and vegetable products under established trade marks, examine the possibility of joint ventures for the production of such brand products in the developing countries, thereby facilitating the export marketing of these products. For this purpose, the industrialized countries should be requested not to permit the term "natural juice" to be applied to juices reconstituted from concentrates in these countries;
- (4) An organization of fruit and vegetable processors in Africa be established with the assistance of UNIDO and the Government of Morocco through OCE and the countries concerned be contacted to ascertain their willingness to initiate its foundation. This organization would serve as a focal point for

collective negotiations on such subjects as the acquisition of patented technology and the purchase of raw material, while introducing such things as training arrangements for persons in the industry, export-promotion programmes directed towards the industrialized countries and the compilation of unified standards;

(5) Growers' interest be increased through improved forms of co-operation with industrial-scale processors so as to ensure the enthusiasm of this group and its active participation in a successful industrialization programme.

Fish

It was recommended that:

(1) The authorities in the African countries be requested to combine their efforts, organize and intensify studies in their territorial waters to determine both the movements and future supply trends of such fish as sardine and tuna; and that specialized agencies such as the Food and Agriculture Organization of the United Nations (FAO) be requested to assist in these studies;

(2) Closer co-operation be established between fish canneries and those companies producing containers in the industrialized countries to take advantage of their up-to-date technology in packaging and to ensure a regular supply of containers with a view to promoting exports of African products;

(3) The African countries study and plan the foundation of a joint African fishing fleet so that full advantage can be taken of fish supplies in the seas at large, thus extending African fishing and preservation capabilities beyond their territorial waters;

(4) A federation of African fish processors be founded to take advantage of collective action in fish canning and preservation as well as in investment promotion and export;

(5) Fish supplies be taken as one of the important factors governing the limits of territorial waters, when these are determined, since the development of fish supplies is essential to the fish industry in African countries.

Meat

In view of the current underutilization of meat as a major protein resource in African countries and the continent's undisputed potential for livestock production, it was recommended that meat production be industrialized following surveys of domestic and external markets to establish optimum capacities and locations of meat-processing plants. The African meat products should be geared towards local and export markets. The operations may be implemented in co-operation with international and national technical assistance organizations as well as with industrial enterprises.

I. ORGANIZATION OF THE CONSULTATION

The Consultation was opened by H. Chami, Director General of OCE, who stressed the importance of the meeting and the food fair in view of the recent profound changes in economic development, the current disorganization of the world monetary system and a growing desire of the developing countries to establish a harmonious international industrial policy. The measures taken by the Government of Morocco to promote the export of processed foods could be emulated as could the high priority it assigned to agricultural products.

He also drew attention to the permanent sovereignty that each State enjoyed over its natural resources and its entitlement to exercise effective control over them and their exploitation. He attributed particular significance to the discussions of the Third Conference on the Law of the Sea held at Caracas, which would have a direct bearing upon Morocco's fish-processing industry. It was also important to give the developing countries access to the achievements of modern science and technology by promoting the transfer of technology and to create indigenous technology for the benefit of the developing countries in forms more suited to their economies than those they had hitherto been using, thereby accelerating the advancement of the developing countries and contributing to the establishment of a new international economic order.

In welcoming the participants, I. H. Abdel-Rahman, Executive Director of UNIDO, drew attention to the benefits that representatives of African countries could derive from an exchange of views among themselves as well as with representatives of industrialized countries. He pointed out that the local processing of agricultural products was part of the general concept of industrialization that had been discussed at length during the sixth special session of the General Assembly, and that international co-operation in industrialization was an integral part of the new international economic order that should be based on equity, sovereign equality, interdependence, common interest and co-operation among all States.

In his address of welcome, A. Ghissassi, Minister of Commerce, Industry, Mines and Shipping, also commented upon the importance of the meeting in the context of a redistribution of economic tasks in the world, which would permit much greater participation by the developing countries in the processing of raw materials.

S. Nzili, Minister of Agriculture and Agrarian Reform, also stressed the importance of the processing sector in his inaugural address. The maximum value should be derived from locally available raw materials; hence the best possible processing methods should be sought. Agro-industrial integration and the effective participation of all concerned with the production process were essential to a country's success in a period in which raw materials were becoming increasingly scarce and prices were rising unrelentingly.

The meeting was attended by 16 participants from Brazil, Burundi, Congo, Dahomey, Egypt, Ethiopia, Ghana, Ivory Coast, Kenya, Madagascar, Senegal and Tunisia.^{1/} Nominated by their Governments, they held managerial or policy-making positions in their own countries.

In addition, 209 observers came from the following countries: Algeria, Argentina, Belgium, Denmark, Egypt, Finland, France, Federal Republic of Germany, Ghana, Iran, Italy, Morocco, Netherlands, Nigeria, Norway, Tunisia, United Kingdom of Great Britain and Northern Ireland, United Republic of Cameroon, United States of America and Yugoslavia.

J. N. Shah (Kenya) was elected Rapporteur, and A. Sedrati and A. Fassi-Fihri (Morocco) Co-Rapporteurs. The following persons acted as Chairmen of the technical sessions:

- D. R. Andrianandrasan (Madagascar)
- A. W. Mark-Hansen (Ghana)
- T. Mekouar (Morocco)
- A. Sfar (Tunisia)

II. SUMMARY OF THE DISCUSSION

Development of the food industry and export promotion

A UNIDO official stressed that upon entering export markets food industries should devote particular attention to quality, standardization, regularity and continuity of supplies. The food-processing industry needed to be highly mechanized if it was to meet the quantitative and qualitative requirements of export markets.

^{1/} The list of participants is contained in document ID/WG.172/20.

If mechanization was to be achieved, local technology had to be available or licensing arrangements made. Proper market surveys were essential to success, as were financing and effective management. Much could be gained from co-operation among the African countries, which could profitably establish common offices in Europe to ensure market impact. It was essential, however, that care be taken at all times to maintain harmonious relations with the developed countries with whom joint ventures and technology transfer could be effected.

The papers presented at the Consultation were prepared by internationally acknowledged technologists, manufacturers of equipment or persons closely associated with food production and export promotion. The papers are listed in the annex.

A paper by H. A. B. Parpia, "Development of agro-industries through the use of appropriate technologies", stressed the need to develop locally available technologies first. Industrialization, however, required management capabilities and a co-ordinated development plan. The disadvantages of "borrowed" technology were described, and it was shown that pilot plants were an effective means of developing technologies appropriate to prevailing conditions.

A paper by H. Henselder, "Commercialisation des produits agricoles transformés", outlined the marketing channels open to potential investors. It stressed the need for careful identification of consumer preferences and showed how eating habits changed in relation to increased income.

In the ensuing discussion, attention was drawn to the manner in which such countries as India and Japan had adapted imported technologies to local conditions and had successfully improvised. It was also pointed out that agricultural products would become increasingly important as developing countries expanded their food-processing industries with a view to reducing the amount of foreign currency at present spent on food imports.

Fruit and vegetable processing

The meeting noted that certain African countries had great potentialities for fruit production, particularly citrus fruits; should the markets prove attractive, the farmers would be able to increase the acreage under cultivation.

It was also pointed out that certain industrialized countries had thriving citrus-processing industries even though they did not grow the fruit themselves.

A paper by A. I. Morgan, "Citrus processing in the USA", indicated the size of the industry and described consumption patterns in the United States of America. It outlined the sorting methods, concentration processes, freezing and oil-extraction procedures, and the environmental and energy problems associated with citrus processing. Changes in citrus-processing methods reflected revolutionary changes in other agricultural sectors and in food research. Because the processing of certain citrus products was economic and efficient, it was attractive to many producer countries. The citrus-processing industry was shown to be a good generator of employment, and it helped to strengthen a country's export potential.

A paper by J. Spilman, "Citrus processing for the world market", drew attention to the very sophisticated nature of processing citrus fruits for the world market. It was a highly competitive market requiring high-quality products marketed effectively and backed up by good technology and good plant management. It emphasized that any potential investor would have to determine that there was a market for his end-product and that he had a continuous supply of good raw material. The parameters for plant construction, design and equipment had to be established; qualified plant management had to be available and careful plans made to allow for expansion.

A paper by J. Hardenmark, "Processing fruit juice - the quality way", described the markets for fruit juices and outlined the various processing stages and possible areas for improvement. It showed that high-quality products could be marketed at good prices, provided that standards were maintained at every stage of the operation. In view of the heavy capital investment involved, the equipment purchased should be used to the maximum possible degree. Proper attention should also be paid to the effective utilization of by-products, such as essential oils, pectin and citrus peels, which were valuable sources of income.

A paper by G. Decio, "New trends in the citrus-processing industry", described citrus-processing equipment designed for the simultaneous production of juice, oil and peel.

In the ensuing discussion related to the above four papers, it was felt that the selection of any equipment, in particular that of evaporators, was governed by the end-use of the product in question. The carbonated beverage industry, for example, could use less sophisticated equipment than companies producing frozen concentrates.

Concentrates, which could be reconstituted and bottled in the importing countries, were felt to be the best form of transporting processed products. If the juices were bottled for sale on local markets, the glass containers used should be returnable. One participant, however, pointed out that disposable containers made of plastic or paper could also be taken into consideration.

A paper by H. Creupelandt, "La promotion des exportations de fruits et légumes en Afrique et leur contribution au développement", stressed the need to introduce effective standardization of fresh produce emanating from Africa. It pointed out that a properly organized marketing body with good storage facilities and freight services could reduce delays, which would thereby improve quality upon arrival and create consumer confidence.

A paper by S. A. Mencacci, "Convenience foods - a way of life", described recent developments in flexible containers, ranging from laminated aluminium foil pouches to thermo-formed plastic containers, and the advantages they offered in continuous processing.

A paper by J. Candia, "Standardization of packaging foods for export", described the advantages of standardization and the latest developments in unitization and containerization, indicating areas for improvement and development. It held that standardization on an international scale was desirable and could be achieved through national committees co-operating in the fields of packaging, standards and transportation.

A paper by E. M. Steinmetz, "Packaging and preservation of quality-processed foods in aseptic drums", described an aseptically filled steel drum that had been designed to meet the mechanical and non-mechanical demands of long-term storage and long-distance shipping. Through the use of such drums, the products were not only safe for human consumption, but also satisfactory in colour, texture and organoleptic characteristics.

A paper by I. V. Mills, "Modern methods of aseptically processing and packaging fruit and vegetable produce", outlined aseptic processing methods

in the food industry and the aseptic drum-filling methods that had been subsequently developed. The continuous high-temperature, short-time techniques used had contributed to quality standards, since they minimized thermal degradation and offered the advantage of extended shelf-life.

In the discussion relating to the above five papers, one participant stressed the advantages that many African countries could enjoy through using bagasse agglomerate for the production of disposable pallets, which were shown to be highly economical. It was also mentioned that an export-oriented fruit-and-vegetable-processing industry was an effective industrial generator, since industries such as equipment manufacture, packaging, printing and sheet-steel production followed in its wake.

Another participant stressed that advantage was not being taken of the work done by numerous research institutes in Africa, with the result that efforts were being duplicated. It was felt that co-ordination of the work of these institutes was essential, preferably through the channels of an international organization.

A special working session chaired by B. Benkirane, President of the Moroccan Federation for Fruit and Vegetable Processing (FICOPAM), was devoted to the specific problems confronting the fruit-and-vegetable-processing industry in Morocco. Four papers concerned with various sectors of the industry were presented: M. Belghiti discussed vegetable canning; H. Taieb, citrus processing; M. Chraibi, spices; and I. Georges, the packaging of fruit.

In the ensuing discussion, the consensus was that much benefit was to be gained from establishing an African organization to ensure effective co-operation among African processors and to protect their interests on a collective basis in export markets. It was also felt that a professional federation of this kind could serve as an effective contact point for packaging and labelling matters and serve the interests of the producer countries in their negotiations with the consumer countries.

Fish processing

A paper by J. Kerdoudi, "Promotion des exportations de conserves de poissons", stressed that successful exports in the fish-processing sector, which was of prime significance to the Moroccan economy, were based upon the

promotion of production, marketing and profitability. The main components of good production were effective quality control, improved product presentation and diversification. Marketing, which OCE carried out in co-operation with the local producers, was based on minimum-price policies and the effective organization of distribution, using either publicity or subsidies. Profitability was assisted by government incentives such as tax rebates, long-term loans at reduced rates and capital transfer for marketing campaigns.

A paper by K. Lenter, "Step-by-step approach to modern fish and shrimp processing", emphasized the need for correct handling of the catch and described the production of slice ice as the most suitable type of ice for fishery use. It described on-shore processing lines for fish, lobsters and shrimp and gave details of planning and engineering procedures when establishing such plants. Product quality was contingent upon proper handling and processing; with the appropriate facilities, many African countries could benefit from their hitherto underexploited fish resources.

A paper by V. Perović, "Aluminium as packaging material for the fish-canning industry", summarized the ways in which aluminium could be used in the fish-canning industry. After listing the advantages of aluminium as a packaging material, the paper described the use of aluminium in sheet form or as laminated foil and discussed its potential applicability in developing countries. Aluminium packaging systems were most useful in cost-benefit terms, and after careful analysis they might be introduced into various countries.

A paper by M. G. Hunter, "Fish curing and drying", stressed the need to prolong the storage life of fish, a valuable protein source, to permit shipment to areas farther removed from the ports. Improved fish-curing systems had been evolved that permitted controlled processing under hygienic conditions. A parallel development had been observed in fish drying, and a process was described that overcame all problems of hygiene and infestation and ensured a good finished product.

A paper by S. Christensen, "Fish meal production", drew attention to the benefits to be derived from fish that could not be gainfully used for direct human consumption. A plant was described that was less sensitive in terms of fish inputs and operating conditions: the system required no steam and the oil content of the final product was unprecedentedly low. Heat economy was shown to be very good and fresh-water consumption was insignificant. A deodorization plant could be added.

A paper by D. W. Everington, "Methods of freezing fish", gave a detailed description of plate freezers (horizontal and vertical), air-blast systems, batch-type trolley freezers, spiral freezing systems and liquid nitrogen systems. The relative operational costs were also compared, and it was emphasized that the final selection was determined by the raw material to be processed, the output required and the availability of labour.

In the ensuing discussion, attention was drawn to the extremely high import duties levied in certain African countries; such duties served as an export disincentive. In any event, export endeavours were best served by effective distribution arrangements in the recipient country.

Discussion also centred upon the conservation of sardines and the work the Moroccan Scientific Institute of Fisheries was doing in this field. The Institute was studying sardine migration that was not caused by pollution. It was reported that Morocco had analysed its fish products and established that the mercury content was well below the maximum permissible level.

It was suggested that the African countries could take collective action to ensure the certainty of supplies within their territorial waters.

It was also pointed out that a careful co-ordination of production and marketing was essential, as was the proper use and control of natural resources. It was felt, however, that these issues were best approached in a spirit of co-operation between developed and developing countries.

The danger of relying upon a single species of fish as a source of raw material supply was emphasized. Morocco was exploring the large-scale exploitation of such species as mackerel, anchovies and tuna.

With particular reference to Morocco, mention was made of the oil required for fish processing, and it was reported that adequate quantities of soya and sunflower oil were imported and subsequently refined locally.

In answer to a question whether using fish meal as a feedstuff ingredient over prolonged periods was dangerous, a participant pointed out that there was no danger and maintained that fish meal would still continue to be widely used in feedstuff for pigs and poultry for many years to come. Another participant spoke of the increasing use of vegetable protein, particularly soya beans, as a feedstuff ingredient.

In a special working session, R. Angelotti presented a paper relating to specific appendices to the regulations published by the United States Bureau of Food and Drug Administration pertaining to good manufacturing practice (sanitation) in the manufacture, processing, packaging or holding of food. The new provisions applied to all firms shipping thermally processed low-acid canned foods to the United States, and failure to comply with them would result in the foods' being refused entry into the United States. These exacting regulations were deemed essential in view of the great potential for serious illness or death associated with inadequate thermal processing of low-acid canned foods.

In the ensuing discussion, it was pointed out that the regulations were sometimes difficult to obtain and often beyond the understanding of plant operators. However, uniformity of such regulations was the ultimate aim, and the United States Government was endeavouring to establish the degree to which acceptance of the Codex Alimentarius was feasible.

A paper by P. L. Audat, "Aliment pour enfants", described a project carried out by the United Nations Children's Fund (UNICEF) and the Government of Morocco for the production of baby foods in an endeavour to combat malnutrition among the three million Moroccan children below the age of four.

Meat processing

A paper by N. E. Wernberg, "Site selection, plant layout and construction of industrial meat-processing plants", treated the subject of planning new industrial-scale meat-processing plants in developing countries to ensure a more profitable utilization of the various meat products and slaughter-house by-products. The various planning stages were described, drawings given and tender procedures explained on the basis of three projects in developing countries.

A paper by A. Holm, "Meat processing in Africa - the project from idea to implementation - an actual case story and practical guidelines", reviewed the basic characteristics of each step in industrial meat processing, the main pieces of equipment, the construction of the processing facilities and supply of raw materials through the analysis of an actual case. Practical guidelines were given for the planning and design of a meat-processing plant in developing countries.

A paper by M. Jul, "Meeting the demands of foreign markets' meat", outlined the steps taken in the Danish meat-processing industry to comply with foreign veterinary and legal requirements. Inspection procedures were explained and new items of equipment described as used in quality control systems that were responsive to changes in both consumer preference and processing technology.

A paper by W. L. Sulzbacher, "Meat dehydration: new aspects of an old industry for developing countries", gave an overview of meat dehydration, touching on specific ideas for food scientists and on general concepts for planners. Dehydrated cooked meat, which could be easily and cheaply produced, was shown to be not only a commercial item for international markets, but also a means of improving domestic diets. Meat dehydration was a process that fitted in well with integrated stockbreeding and processing facilities, and an integrated processing facility could well be an integral component of an associated facility producing dehydrated convenience foods.

A paper by P. Filstrup, "Processing of by-products in modern slaughter-houses", described various means of recovering such slaughter-house by-products as non-edible raw material, blood and edible raw fat and converting them into valuable commercial protein products for human and animal consumption. Modern processing equipment was described and their techno-economic advantages highlighted.

A paper by G. Löndahl, "Modern freezing methods and cold store design", described various items of freezing equipment from the standpoint of design, operations and economics. The siting and layout of cold stores were also discussed and their suitability for various conditions indicated, the degree of mechanization being related to the extent of turnover and market development.

In the ensuing discussion, emphasis was laid on the need to adapt scientific principles to local requirements. It was felt that equipment could be manufactured locally once the know-how had been acquired in co-operation with the industrialized countries. Traditional methods could be improved. In view of current constraints, particular attention would have to be devoted to energy requirements in order to be able to identify the most suitable form of processing. As an example, one participant described fish-preservation equipment in which the main boiler plant was fired by wood, an energy resource that had

hitherto not been widely used, and electricity was used solely to drive a fan. At the same time it was stressed that the selection of processing methods was also governed by quality requirements of the markets, which were frequently strict.

Attention was also drawn to the loss of valuable protein through the failure to utilize effectively the numerous by-products. Centralization of slaughtering facilities would greatly facilitate the proper utilization of by-products, and it was the consensus that the African countries would derive great benefit from the large-scale industrialization of meat production in view of the continent's tremendous potential for livestock production.

It was also felt that an international source monitoring information on livestock production and export market requirements would contribute to the effectiveness of a newly developed meat industry. This source could provide data on licences and equipment and assist in identifying the problems confronting the meat-processing industries in the African countries. It could also assist these industries to penetrate both domestic and foreign markets.

One participant pointed out that a major constraint upon the growth of the food industry in the developing countries was the lack of trained personnel experienced in business administration and in the practical application of technology. It was suggested that an appropriate training institute would do much to alleviate the problem.

ANNEX

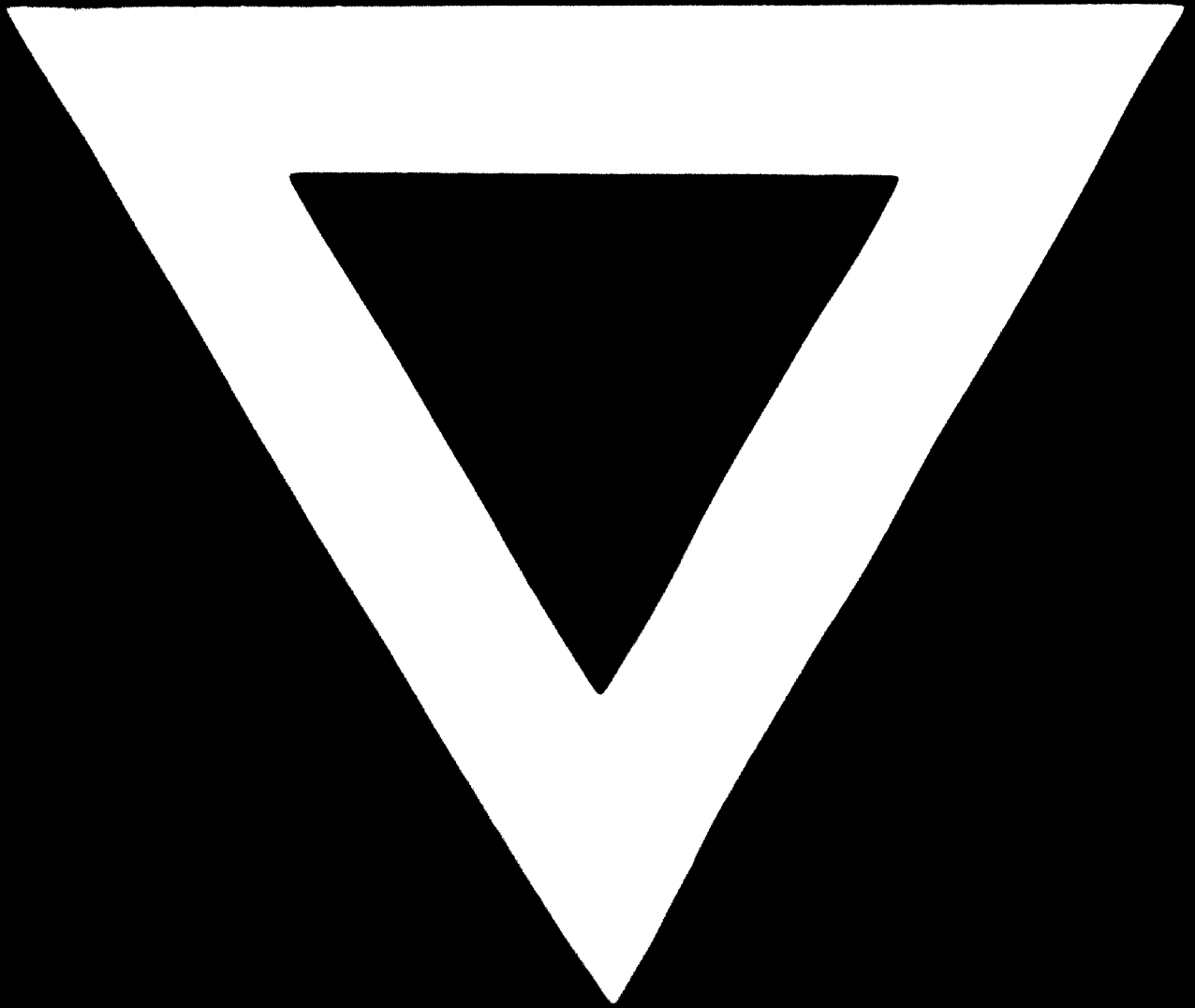
LIST OF DOCUMENTS^{a/}

- ID/WG.172/1 Meat dehydration - New aspects of an old industry for developing countries
W. L. Sulzbacher, United States of America
- ID/WG.172/2 Site selection, plant layout and construction of industrial meat processing plants
N. E. Wernberg, Denmark
- ID/WG.172/3 Meeting the demands of foreign markets' meat
M. Jul, Denmark
- ID/WG.172/4/
Rev. 1 Convenience foods, a way of life
S. A. Mencacci, United States of America
- ID/WG.172/5 Standardization of packaging goods for export
J. Candia, United Kingdom of Great Britain and Northern Ireland
- ID/WG.172/6
and Corr. 1 Aluminium as packaging material for the fish canning industry
V. Perović, UNDP/FAO, Morocco
- ID/WG.172/7 Citrus processing in the United States
A. I. Morgan, Jr., United States of America
- ID/WG.172/8 Meat processing in Africa - the project from idea to implementation - an actual case story and practical guidelines
A. Holm, Denmark
- ID/WG.172/9 Processing fruit juice - The quality way
J. Hardenmark, Sweden
- ID/WG.172/10 Processing of by-products in modern slaughterhouses
P. Filstrup, Denmark
- ID/WG.172/11 Modern methods of aseptically processing and packaging fruit and vegetable products
V. Mills, United States of America
- ID/WG.172/12
and Add. 1 Modern freezing methods and cold store design
G. Löndahl, Sweden
- ID/WG.172/13 The step by step approach to modern fish and shrimp processing
K. Lentner, Denmark
- ID/WG.172/14 Methods of freezing fish
D. W. Everington, United Kingdom of Great Britain and Northern Ireland

^{a/} A limited number of copies are available from UNIDO upon request.

- ID/WG.172/15 Fish meal production
S. Christensen, Sweden
- ID/WG.172/16 Fish curing and drying
M. G. Hunter, United Kingdom of Great Britain and Northern Ireland
- ID/WG.172/17 Citrus juice processing for the world market
J. Spilman, United States of America
- ID/WG.172/18 Commercialisation des produits agricoles transformés
H. Henselder, Federal Republic of Germany
- ID/WG.172/20 List of participants





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