



TOGETHER
for a sustainable future

OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.



TOGETHER
for a sustainable future

DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

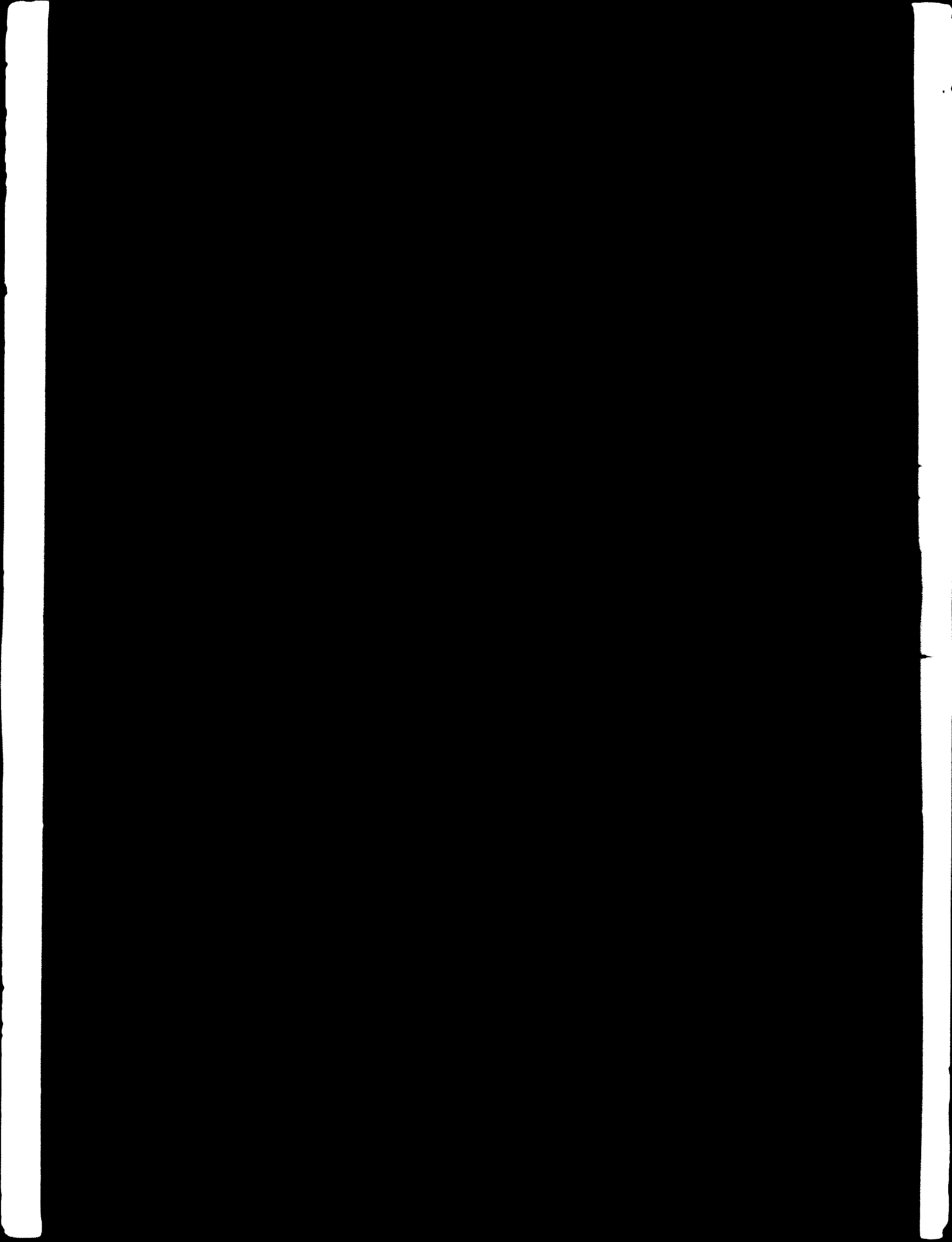
FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org





06887



Distr.
LIMITED

ID/W.212/19
30 December 1975

ORIGINAL: ENGLISH

United Nations Industrial Development Organization

**Symposium on the Prospects for Industrial
Heat Processing in Developing Countries**

Vienna, Austria, 13-17 October 1975

FINAL REPORT

14.73-9287

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Mention of commercial, industrial or other firms in this document does not imply endorsement of them or of their products by the Secretariat of the United Nations.

10-11

CONTENTS

<u>Chapter</u>	<u>Page</u>
INTRODUCTION.....	4
CONCLUSIONS AND RECOMMENDATIONS.....	5
I. ORGANIZATION OF THE SYMPOSIUM.....	6
II. FIRST SESSION.....	7
III. SECOND SESSION.....	8
IV. THIRD SESSION.....	9
V. FOURTH SESSION.....	10
VI. FIFTH SESSION.....	11
VII. SIXTH SESSION.....	12
VIII. SEVENTH SESSION.....	13
IX. CLOSING SESSION.....	14

APPENDIX

I. Officers of the Symposium.....	15
II. List of participants.....	16
III. List of documents.....	20

INTRODUCTION

The Symposium on the Prospects for Industrial Meat Processing in Developing Countries was held in Vienna from 13 to 17 October 1975. It was convened by the United Nations Industrial Development Organization (UNIDO), and its primary purposes were to appraise the technical, technological, marketing, economic and financial problems confronting the meat-processing industries of developing countries in Africa, to consider appropriate solutions to them, and to examine the opportunities open to these countries in this industrial branch.

UNIDO was aware of the many technical and technological problems that confront this industry, and it was expected that the subjects to be discussed would fall into the three following main groups:

Market requirements, export possibilities, prevailing conditions in the meat-processing industry in Africa, existing shortcomings and constraints and possible ways of eliminating them, and the potential for further development of the industry

Unit operations, processes and equipment, types and qualities of products, products based on meat-industry by-products and specific processing technologies suitable for local conditions

More general questions such as vertical integration, regional planning, managerial matters and the training of technical personnel

It was fully recognized that there were many other topics that were equally important for many countries, such as problems of animal diseases, selection of breeds, animal feeding and organization of veterinary inspection services, but these topics lie basically beyond the scope of UNIDO activities. Also, if the programme were expanded along these lines, the background and experience of the participants would have had to be more diversified, and it is doubtful whether all of them would have benefitted much from topics which were not fully in line with their specializations.

From the expressed interest and very competent contributions to the discussions, it was evident that most of the participants had adequate backgrounds and that they were familiar with the subjects discussed. All of them were very eager to exchange views. Considerable interest was expressed in meetings of this kind, and suggestions were made that similar ones be organized on a regular basis in future.

CONCLUSIONS AND RECOMMENDATIONS

It was agreed that the principal problem of the meat industry in some African countries is that of exports, mainly to Europe. The main difficulty here is concern in those markets over animal health. In another group of countries, the existence of animal disease prevents the export of fresh meat to developed countries, although much meat is available for export as canned meat, mainly as corned beef. Furthermore, the market for such products was uncertain and depressed at the time of the meetings.

In some other countries, the primary problems relate to the domestic market. Among these are those of applying the principles of modern technology without having to use large-scale, high-cost, labour-saving methods of the developed countries.

It was recognized that there are unrealized possibilities for intra-African trade, but such trade is now difficult, or even impossible in some cases, because of the inadequacy of transport routes.

The basic recommendations that emanated from the Symposium may be summarized as follows:

1. Further conferences of this type should be organized and held regularly.
2. The next such meeting should preferably be held in an African country.
3. Study tours for all participants in meetings of this kind would help to familiarise them with the development of the meat industry in other African countries.
4. The full proceedings of this Symposium should be made available in both English and French; the same should be done in all future meetings.
5. Some topics to be dealt with in future meetings include:
 - Application of the principles of modern technology under African conditions
 - Geographic and economic problems of intra-African trade
 - The training of key personnel for the meat-processing industry

I. ORGANIZATION OF THE SYMPOSIUM

The Symposium was convened by the United Nations Industrial Development Organization (UNIDO). It dealt with some specific problems of the development of industrial meat processing in African countries. Both the documents presented and the discussions that followed touched upon many aspects of meat processing, from general surveys of this sector in various countries to technical details related to the manufacture of various products, the utilization of by-products and vertical integration.

The Symposium was attended by 16 participants from 14 African countries as well as by 27 authors, observers and representatives of international organizations (Economic Commission for Africa, European Economic Community), research institutes and commercial firms. The list of participants is attached as annex II.

The opening statement was made by A. Niklovic, Chief, Light Industries Section, Industrial Technology Division of UNIDO. In addition to the opening and closing sessions, there were seven working sessions. During the sixth session, samples of various meat products were tested and samples of various packages and casings were examined. Several films on the production of sausages, salami and casings were also shown. A visit was made to a meat-processing plant in Gras.

Each session of the Symposium had a chairman and a vice-chairman who conducted the presentation of papers and discussions. ✓ The final agenda as well as the chairman and vice-chairman of the sessions and the rapporteur were selected and approved by consensus. The chairman of each session prepared a short summary of the deliberations; these were compiled and reported by M. D. Ranken, who acted as the rapporteur of the Symposium during the closing session.

The total number of the participants, authors and observers was limited by the funds and facilities that were available. The papers that were presented are listed in annex III.

✓ The names of these officers are given in annex I.

II. FIRST SESSION

In the paper "Present and potential meat products based on the raw materials available in African countries" (ID/WO.212/1), M. Sapina reviewed some aspects of livestock and meat industry development in various regions of Africa, the quality of meat and its suitability for industrial processing. The relevance of local customs and traditions as well as the future potential were indicated, particularly for the production of various types of sausages from the locally available meat, primarily beef.

The second paper, "Factors affecting the growth of industrial processing of meat products" (ID/WO.212/10) by N. D. Ranken did not refer specifically to African conditions but more to the general aspects of meat products development, from ancient to modern times. Various types of meat products were touched upon, and some interesting postulates were mentioned.

During the discussion, it was emphasized that ruminants were the most important animals for the development of a meat industry in Africa. It was brought out that improved cropping of the present herds is required.

It was noted that producers are not always sensitive to the economic potential of the meat industry. Consequently, efforts to involve producers in the meat-processing industries in some way might be useful.

As one interesting detail, the washing of carcasses in meat processing plants was discussed. When carcasses were artificially chilled, good results had been obtained with a very hot rinse (85°C) or with a rinse containing up to 100 parts per million (ppm) of chlorine, where this practice was acceptable.

In many places, all parts of an animal are used directly for human consumption as fresh meat. When this is not the case, the development of an industry to utilize edible by-products, for example in products such as sausages, was indicated as desirable. In the past, much effort had met with limited success insofar as products common in many developed countries were concerned, while many products of a traditional African type had met with a high degree of acceptance. The development of a dry sausage industry was considered promising in Africa.

III. SECOND SESSION

In his paper, "An African meat plant - a case study" (ID/WG.212/5), S. Liptay-Wagner described the establishment of an actual meat plant. Information concerning the original requirements in respect to the plant's capacity, the selection of the site, planning of the plant's units, construction, cost breakdown and basic drawings was presented.

In the second paper, "Development of meat-processing industries in various countries" (ID/WG.212/2), N. E. Wernberg described the meat industry in the developed and developing countries and evaluated the future possibilities in countries classified in three economic categories, covering 132 countries. Based on the collected statistics, an indication was given on the number of plants to be built in the future, their capacities and investment costs required for countries belonging to each of the three classes. The enormous investment involved indicates the great importance of the proper selection of factors such as sites, plant design, capacity and technology.

In the third paper, "Public abattoirs or industrial meat plants" (ID/WG.212/7) M. Jul and E. G. Brock compared such factors as production methods, technical advantages and disadvantages, economic sizes, investment costs, and operating costs between traditional public abattoirs and modern meat plants. Several graphs showed how the variables depend on the capacity of the abattoirs and suggested considerable advantages in establishing industrial abattoirs.

In the discussion which followed, various questions were touched upon. Although some doubts were expressed on the usefulness of some sophisticated equipment, particularly in rural areas, it was generally agreed that cold-storage facilities should be considered as a basic requirement. Among the topics discussed in relation to the first paper were the location of slaughtering facilities in the area of sale or production, use of pre-fabricated buildings, one-floor or two-floor construction and sewage treatment.

It appeared that there is a trend away from Chicago-style slaughterhouses because of difficulties in the transport of live animals. On the other hand, co-operatives of the Scandinavian type were considered too small at the slaughterhouse level. Local conditions should therefore determine the technological level of plants; simple transfer from other countries should not be accepted without thorough examination.

It was suggested that meat be considered as a cash crop and the meat industry as one that creates employment for the local population. They should be treated accordingly.

IV. THIRD SESSION

In the paper "Modern machines in the meat-processing industry" (ID/WG.212/8), P. Lanka and A. Klein presented information on modern, labour-saving, high-volume-production meat-processing equipment. It dealt with sausage and ham production equipment as well as with canning equipment and packaging meat products. Various models of such equipment as cutters, mincers, slicers, emulsifiers, mixers, smoking units, pickle injectors and vacuum-massing units were described.

The discussion which followed centred on such questions as the speed of cutters' knives, the ageing of meat in plastic bags, problems in using clip seals, repair and maintenance of more sophisticated equipment, and employment problems when using labour-saving equipment.

The next paper, "The utilization and processing of blood" (ID/WG.212/3), by H. Nilsson, emphasized the advantages of utilizing blood wherever possible. The process was described in detail, from blood collection to its processing by separation of plasma proteins and blood cells, freezing, drying, etc., and the utilization of final products for human consumption as well as for medical and pharmaceutical products.

From the ensuing discussion, it appeared that, in some cases, economic factors determine the viability of blood processing and utilization. The volume of blood collected daily, the availability of water, sewage problems and local customs, including religions, all determine whether or not a decision could be made on the investment in a blood-processing installation. Although different views were expressed, some important questions were clarified.

In his paper "The importance of food additives in the manufacture of meat products" (ID/WG.212/1), G. M. Lippmann dealt with various additives such as salt and curing salts, polyphosphates, emulsifiers, milk and vegetable proteins, binders, fillers, and thickeners, curing enhancers and stabilizers. It described their properties and some technological aspects of their use.

Although such additives are manufactured and used in many countries, one could note from the discussion that the situation is not very clear in respect to some of them. Some additives have been or might be banned in some countries (for example, nitrates and nitrites), while new additives and formulations are being developed. Although the additives contribute to the appearance and properties of meat products, certain precautions in using some of them were suggested. Divergent views on this subject were noted.

V. FOURTH SESSION

"The regulation of meat importation into the United States" (ID/WG.212/4), by H. N. Steinmetz, was the first paper presented at this session. It reviewed the basic criteria of that country's inspection system and exporting plants, the operations of the foreign review team, inspection of meat products on entry into the United States, and the consultation and training facilities available to foreign countries.

The second paper, "Microbiological control in the meat-processing industry" (ID/WG.212/6), by E. J. Dyett, was related to more specific aspects of food poisoning, bacteriological standards and bacteriological testing as well as with the control of temperature with time, and control of equipment, persons and processes.

It was clear from the discussion that some countries are interested in exporting meat products and, in order to do so, they have no choice but to comply with the regulations of importing countries. Some participants were not fully aware of the procedures and possibilities, and detailed information was given in this respect. Although United States regulations are very strict, it seems that the ability to comply with them should be considered as an important goal, since other developed countries are adopting similar regulations.

As regards microbial control in meat-processing plants, several details were discussed and queries made on such matters as disinfection of plants and clothing, the value of routine medical inspection of staff and antemortem inspection of animals, sanitary dressings and the cleanliness of conveyor belts.

The last paper presented at this session was "La production d'extraits de viande dans les pays en voie de développement en Afrique - Aspects techniques, économiques et commerciaux" (The production of meat extracts in the developing countries of Africa - technical, economic and commercial aspects) (ID/WG.212/14) by P. Bollin. This paper reviewed some aspects of the production of meat extracts and included some interesting statistics, particularly on the quantity and value of meat extracts imported into the Federal Republic of Germany.

The discussion which followed was less related to the equipment and production technology than to some commercial matters, such as declaration of the product (which in the Federal Republic of Germany was classified neither as meat nor as meat product), price fluctuations, and the so-called "Chinese-restaurant syndrome" caused by over use of monosodium glutamate. The basic questions on the future production of and trade in meat extracts, whether new plants should be established or not, and how their future prices will be, could not be answered. It seemed difficult to predict the future of this sector; at least, definite answers could not be given by any of the participants, and it was suggested that some steps be taken to clarify the situation.

VI. FIFTH SESSION

Four documents were presented at this session: "Traitement des viandes au Rwanda" (Meat processing in Rwanda) (ID/WG.212/15), by J. Gakoko; "Specific aspects of meat processing in Kenya" (ID/WG.212/18), by P. N. Mutura; "Some aspects of the meat industry in African countries" (ID/WG.212/13), by A. J. Weitenberg; and "The meat-processing industries of some African countries" (ID/WG.212/16), by J. Owen and G. A. Norman. These papers, which concerned the development of the meat industry in some African countries, contained statistical and other information on individual countries, their livestock production, marketing and processing industries, the utilization of by-products, economics, the provision of qualified personnel, and certain development projects. Botswana, Kenya, Madagascar, Nigeria, the Sudan and Tanzania, as well as some regional groupings, were covered. Many details were given on such specific problems as the under-utilization of existing capacities, hygienic conditions, production costs, and exports and imports.

The discussion that followed indicated that Africa could be an important producer of meat products without necessarily being a great consumer of them; the potential was there. Transportation, of both live animals to slaughterhouses and finished products to the market, presented problems in many areas, not only because of high costs but also because of the reduced quality that it caused. Although there were plants that successfully manufactured canned products such as corned beef, and new plants are planned, the supply and cost of tin-plate cans restricted the development of canning industries in some countries. There were also other constraints related to certain import restrictions and non-preferential treatment, tariffs and poor relations between livestock producers and meat packers. Traders and small butchers also created many difficulties, and the price policies of Governments are not clear everywhere. It was emphasized that meat by-products were not fully exploited, and that there were large stocks of canned beef for which there was no ready market. The possible processing of game animals in some game reserves was also discussed.

VII. SIXTH SESSION

The paper "Intégration verticale de l'Industrie de la viande" (Vertical integration of the meat industry) (ID/WO.212/11) by L. Todoric, described how the meat industry in the Yugoslav province of Vojvodina was integrated. The production of livestock and animal feedstuff, slaughterhouses and meat-processing plants, as well as distribution and marketing of products, were all interrelated. Such integration may also include, to a certain extent, other sub-sectors of the food industry and such joint activities such as planning, financing, research and development, and co-operation with individual farmers and co-operatives.

The discussion which followed indicated that a similar organization of the meat industry would be applicable to African countries, and that a similar pattern was being followed by the broiler chicken business in England.

Following the paper on The meat-processing industry in Ethiopia (not reproduced), by G. Kejela, which described the present situation of the meat industry in that country, the discussion dealt with the subject of this as well as of other papers.

Mention was made of the utilization of blood for feeding, as tested in Malawi, after adding 1 per cent of formalin, followed by drying at 25°C for two

to four days until the moisture content is reduced to about 10 to 15 per cent. Other subjects, among them the rendering of fat, problems of supply of cans for canning and the main causes of can swelling, were also discussed.

Much interest was expressed in the processing of elephant, buffalo and hippopotamus meat. Detailed descriptions were given on how the animals are immobilized with succinyl choline darts, bled, eviscerated, skinned, cooled, de-boned, brined, cooked and canned.

The second part of the session was devoted to the inspection and testing of samples, packages and casings of meat products. Various types of sausages, salamis and canned products from several African countries were shown. Some of the products were made with various additives and spices, and some were made from beef; they were of particular interest to participants who came from countries where only beef is available. It was felt that the consumption of some of the products tested would be more or less limited to urban areas. Some films on the production of sausages and collagen casings were also shown.

On the next day, an Austrian plant that manufactured such items as sausages, salami, smoked meat rolls and hams was visited. A number of details were discussed with the management, who explained the operation of the installed equipment (cutters, mincers, fillers, smoking ovens etc.), types of products and their production technology, sanitary maintenance, productivity, organization of the company, distribution of products, production control and relations with a slaughterhouse supplying meat.

VIII. SEVENTH SESSION

This session was devoted to the presentation by J. J. Rateau of a report now being published by the European Economic Community (EEC) concerning food research there. It described centres in which research is currently conducted in the food industry sector. The main conclusions were that private and industrial financing were generally greater than government financing, and that many research institutes are probably too small for optimum effect. The greatest volume of research and the largest research institutes are to be found in the United Kingdom; the largest budgets were those of the Federal Republic of Germany and France. Other activities of the EEC in this area include an investigation

into the research costs, a study of the properties, including nutritional properties, of industrially processed food, fostering communications among research workers and the transfer of technology to developing countries.

It was mentioned in the discussion that the relatively low United Kingdom budget for research, compared with the large number of researchers, indicates that research need not be expensive. The transfer of the benefits of research and the flow of information were being emphasized as being very important. One participant said that he sometimes has to find out in Europe about work going on in his country. Mention was made that the United Kingdom has a very well-organised food industry research, while in France research in the field of agriculture seems to dominate.

IX. CLOSING SESSION

The Chairman of each session had prepared short notes on his session, and the Rapporteur, M. D. Ranken, used them to prepare his report on the Symposium. He indicated that interesting trends could be observed in the progress of this meeting: broad principles on the first day; irritations on the second (mainly due to the failure of the Europeans to deal with African problems in African terms); dialogue on the third day, when the African viewpoint really was stated clearly; to a real unity growing out of the interesting visit to the meat-processing factory the next day. Still, there were problems that stemmed from the sheer size of Africa and the huge range of the conditions there, which could not be completely taken into account.

The reports of the Chairman of the individual sessions were approved, and recommendations for further action and future meetings of this kind were agreed upon.

ANNEX I

OFFICERS OF THE SYMPOSIUM

<u>Session</u>	<u>Chairman</u>	<u>Vice-Chairman</u>
Opening and First	M. Jul	A. Y. Nymand
Second	A. J. Mattenborg	A. G. Kojala
Third	H. N. Steinmetz	P. N. Ntura
Fourth	G. Bary	N. Nilsson
Fifth	B. J. Byott	G. K. Okunola
Sixth	G. R. Lippmann	B. Abdoul
Seventh	J. B. V. Schocku	N. Adjidji

ANNEX II

LIST OF PARTICIPANTS

GOVERNMENT AGENCIES

ABDEL-RAHID, I. M.	Meat Technologist	Industrial Research and Consultancy Institute Khartoum, Sudan
ABDUL, B.	Directeur Général	Société d'Etat de Gestion des Abattoirs (S.E.G.A.) Bangui, Central African Republic
ABUDUJI, H.	Directeur Général	S.O.S.E.P.A. Yaoundé, Cameroon
AYARI, H.	Ingénieur	C.N.E.I. Tunis, Tunisia
BAH, S.	Directeur	Abattoir Frigorifique Ouagadougou, Upper Volta
BAHMENT-OUYANG, H.	Chef de Service Neotechnique	Direction d'Elevage et Industries Animales Libreville, Gabon
CHUMBA, H. K.	Regional Manager	Cold Storage Board of Zambia Lusaka, Zambia
CHUND, J.	Directeur	Direction de la Production Animale Ministère de l'Agriculture et de l'Elevage Kigali, Rwanda
CHUMBA, A. G.	General Manager	Ethiopian Meat Concentrate Share Company Addis Ababa, Ethiopia
CHUMBUKOTO, B. S.	Factory Manager	Kenya Meat Commission Athi River, Kenya
CHUMBU, J. B. U.	General Manager	Tanganyika Packers Limited Dar-es-Salaam, Tanzania
CHUMBA, P. H.	Managing Director	Uplands Bacon Factory (K) Ltd Uplands, Kenya
CHUMBA, A. Y.	Ingénieur Froid Industriel et Alimentaire	Ministère de l'Équipement Rural Direction du Génie Rural Lomé, Togo
CHUMBUKOTO, V.	Chef de Service	Service Provincial de l'Elevage Tananarive, Madagascar

Authors

HOLLIN, F.	Economist	Volker Von Sengbusch Nobach-Waldstadt Federal Republic of Germany
DYETT, E. J.	Chief Microbiologist	The Walls Meat Company Ltd London, England
JUL, N.	Director	Meat Products Laboratory Danish Ministry of Agriculture Copenhagen, Denmark
KLEIN, A.	Export Sales Manager	Johann-Laska und Söhne Vienna, Austria
LASKA, F.	President	Johann-Laska und Söhne Vienna, Austria
LIFFMANN, G. W.	Industrial Adviser	Gehr. Guillini GmbH Research and Development Laboratorien Ludwigshafen, Federal Republic of Germany
LIFTAY-MAHER, S.	Adviser	Intercooperation Co. Ltd for Trade Promotion Budapest, Hungary
WILSON, R.	Section Head	Swedish Meat Research Centre, Section for Chemistry and Bio-chemistry Kävlinge, Sweden
COHN, J. B.	Senior Scientific Officer	Tropical Products Institute London, England
BARBER, R. D.	Head, Meat and Fish Products Section	The British Food Manu- facturing Industries Research Association Leatherhead, Surrey England
RAVEN, J. J.	Division Alimentation/ Bein/Papier	European Economic Com- munity Brussels, Belgium
BAPIER, R.	Director	Uniprojekt Maschinenhan- delsges. mbH Vienna, Austria
STACHNUS, H. H.	Director, Foreign Programmes, Meat and Poultry Inspection	United States Department of Agriculture Animal and Plant Health Inspection Service Washington D.C., United States of America

Other than government residences.

TOBORIC, L.	Director	Federal Centre for Agriculture and Industrial Managers' Training Novi Sad, Yugoslavia
WEISSBURG, A. J.	Food Industries Officer	Economic Commission for Africa Addis Ababa, Ethiopia
WERNING, M. B.	Consulting Engineer	Consulting Engineers and Architects to the Meat Processing Industry A/S Copenhagen, Denmark
CHADIAN		
HERZOG, B.	Director	Johann Lacka und Söhne Vienna, Austria
BEUER, K.	Experteiter	Naturin-Werk Becker Co. Weinheim/Bergstr. Federal Republic of Germany
BOUCHERON, H.	Engineer	Department of Techno-Economics Battelle Centre de Recherche de Genève Geneva, Switzerland
BRASCHER, J.	Director	Faseda Basel, Switzerland
BRUNO, A.	Expert chargé d'études industrielles	Bureau de Développement Industriel Abidjan, Ivory Coast
LAUREN, J. G. W. H.	Product Group Manager	Oranco B. V. Slaughterhouse and Meat Processing Division 's-Hertogenbosch, Netherlands
BRUNENBERG, H. T.	Veterinarian Public Health Officer	Veterinary Service Ministry of Agriculture The Hague, Netherlands
POPOV, M.	Adviser	L. M. B. Meat Industry Section Addis Ababa, Ethiopia
FRANCOIS, F.	Adviser to the General Director	Polimex-Cekop Ltd Warsaw, Poland
SHULIN, S.	Adviser	UNIDO-Yugoslavian Centre for Int. Co-operation in Development of Agro-in Industries Novi Sad, Yugoslavia

WONGHANG, A.

Consulting Engineer

Konsultörande Ingenjörbyrå
Malmö, Sweden

TOJACIĆ, S.

Chief, Technology and
Projecting Department

Yugoslav Food Industry
Institute
Novi Sad, Yugoslavia

BIERS, P.

Werkleiter


Handmann
Biberach an der Riss
Federal Republic of
Germany

Annex III

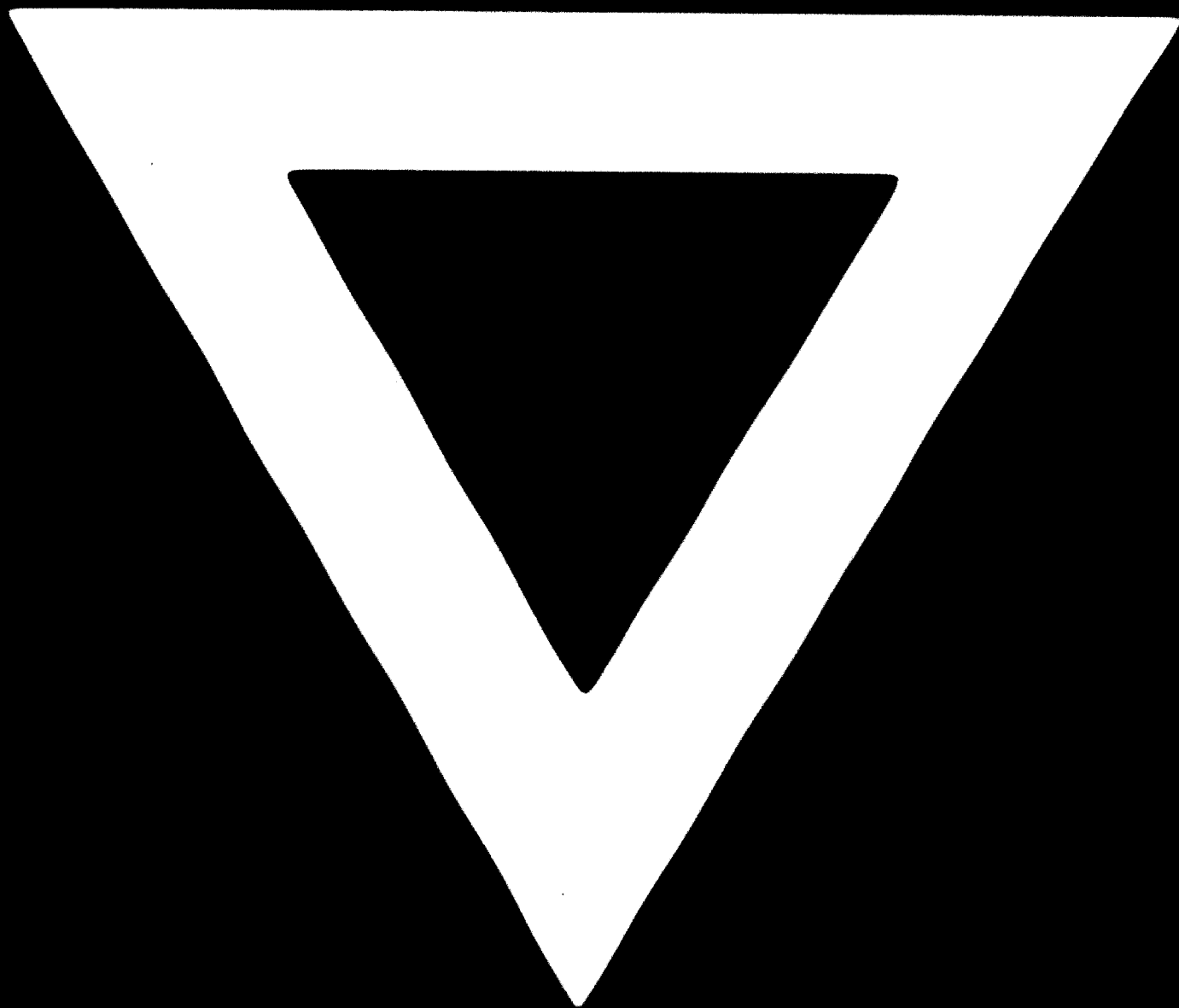
LIST OF DOCUMENTS

- ID/WG.212/1 Present and potential meat products based on the raw materials available in African countries
M. Sapina, Austria
- ID/WG.212/2 Development of meat-processing industries in various countries
N. E. Wernberg, Denmark
- ID/WG.212/3 The utilisation and processing of blood
R. Nilsson, Sweden
- ID/WG.212/4 The regulation of meat importation into the United States
H. N. Steinmetz, United States of America
- ID/WG.212/5 An African meat plant - A case study
S. Liptay-Wagner, Hungary
- ID/WG.212/6 Microbiological control in the meat-processing industry
E. J. Dyett, United Kingdom of Great Britain and Northern Ireland
- ID/WG.212/7 The importance of food additives in the manufacture of meat products
G. N. Lippmann, Federal Republic of Germany
- ID/WG.212/8 Modern machines in meat-processing industry
F. Laska and A. Klein, Austria
- ID/WG.212/9 Public abattoirs or industrial meat plants
H. Jul, Denmark
- ID/WG.212/10 Factors affecting the growth of industrial processing of meat products
N. D. Ranken, United Kingdom of Great Britain and Northern Ireland
- ID/WG.212/11 Intégration verticale de l'Industrie de la viande
L. Todoric, Yugoslavia
- ID/WG.212/13 Some aspects of the meat industry in African countries
A. J. Weitenberg, Ethiopia
- ID/WG.212/14 La production d'extraits de viande dans les pays en voie de développement en Afrique - Aspects techniques, économiques et commerciaux
F. Bollin, Federal Republic of Germany

✓ A limited number of copies of these documents are available from UNED upon request in the language in which they were issued (English or French).

- ID/MS.212/15** **Traitement des viandes au Rwanda**
J. Gakoko, Rwanda
- ID/MS.212/16** **The meat-processing industries of some African countries**
J. Owen and G. A. Norman, United Kingdom of Great Britain and
Northern Ireland
- ID/MS.212/18** **Specific aspects of meat processing in Kenya**
P. N. Mutum, Kenya
- Meat-processing industry of Ethiopia**
G. Kejela, Ethiopia
- 

C - 269



77.06.29