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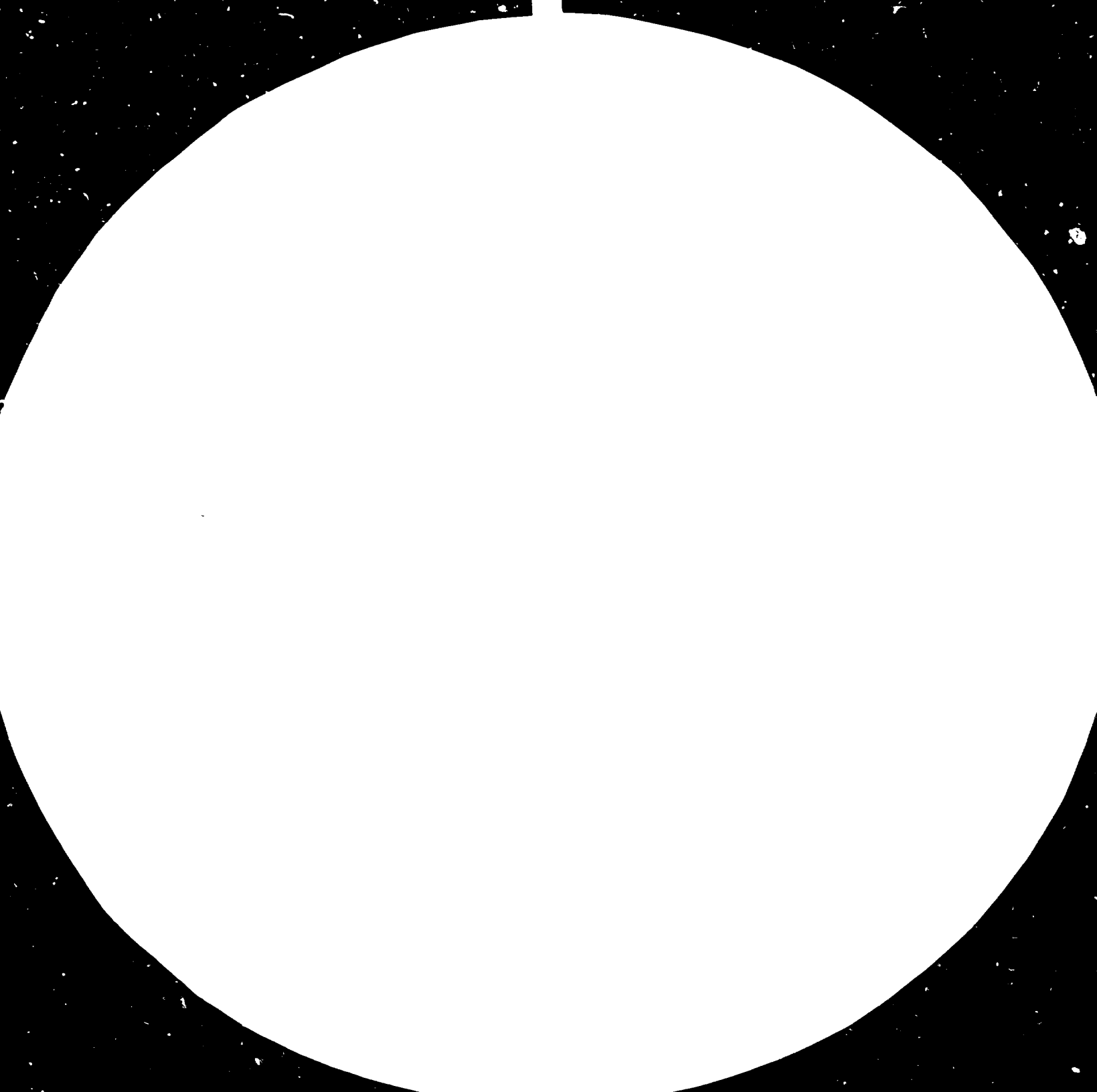
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Second Consultation on the Food-Processing
Industry with Special Emphasis on
Vegetable Oils and Fats

Copenhagen, Denmark, 15-19 October 1984

Issue No. 1

AN INTEGRATED APPROACH TO FOOD PROCESSING:

VEGETABLE OILS AND FATS, ANIMAL FEED,

MEAT AND DAIRY INDUSTRIES*

prepared by

the UNIDO secretariat

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SUMMARY

This issue paper, stressing the role of food-processing in industrial development, deals with the problem of integrated development of food-processing using as an example the manner in which vegetable oils and fats, animal feed, meat and dairy industries are linked to each other. It draws attention to the mutual interests between partners from industrialized and developing countries to collaborate in this sector. It suggests some specific areas on which such international co-operation may be possible, such as:

- Mastering processing techniques which facilitate the valorization of by-products and co-products for food and non-food use;
- Managing processing plants, including procurement, maintenance and repair of machinery and equipment;
- Initiating of long-term marketing and distribution policies, including studies of changes in food consumption patterns.

For an understanding of the development trends, limits, strategies and perspectives of food-processing industry in developing countries, it is suggested that participants consult two background papers "Differentiated approach for the industrialization of food-processing in the developing countries" (ID/WG.427/3) and "Context and potential benefits of food-processing in developing countries" (ID/WG.427/4), as well as information papers providing details about the particular sub-sectors of the food-processing industry (see Annex I). The second world-wide study on "The vegetable oils and fats industry in developing countries: Outlook and perspectives" (UNIDO/IS.477) contains an analysis of the present world and developing countries' output of vegetable oils, oilmeals, international trade, consumption, processing of oilseed, capacity utilization and opportunities for an integrated development strategy.

I. INTRODUCTION

1. The First Consultation on the Food-Processing Industry, held in The Hague in 1981, recognized that the integrated approach^{1/} to the food-processing industry was of major importance as regards self-sufficiency in food^{2/}. The prevailing situation in developing countries has not contributed to further the integrated approach to food processing^{3/}. It is characterized by the following factors:

- Decreasing supply, particularly in Africa, of domestically processed food to meet increasing demand of the population, due inter alia to preferences for commodity exports;
- Increasing dependence on imported food, due to growth in population and rapid urbanization;
- Lack of, or deficiencies in, national strategies and policies for the promotion of local food-processing;
- Insufficient complementarity between agricultural production and food-processing as a result of weaknesses in agriculture-industry linkages.

2. As a first step towards an integrated approach, it would be necessary to consider what measures might be adopted by the developing countries to overcome these constraints.

^{1/} For the purposes of this paper, an integrated approach means a set of interrelated and co-ordinated activities aimed at achieving a balanced development of all elements of a given complex on which food-processing may be based, including production of agricultural commodities, their transformation and marketing, with a view to optimizing the production effects.

^{2/} "Report of the First Consultation on the Food-Processing Industry", ID/278, p. 5.

^{3/} For a more detailed presentation, please see both background papers documents ID/WG.427/3 and ID/WG.427/4.

II. FOOD-PROCESSING AS KEY AGENT OF INDUSTRIALIZATION AND FOOD
SELF-SUFFICIENCY

3. The food-processing industry is a vital sector at least on three main counts.
4. Firstly, it is the largest single industrial sector in most developing countries, with the consequent ability to provide jobs to a large group of the population and expose them to assimilation of production techniques. It constitutes a market for agricultural products and through their transformation contributes to increased manufacturing value added. The industry plays a regulatory role with respect to the prices of agricultural commodities and the level of wages.
5. Secondly, the food-processing industry assists the development of the agricultural sector, through the creation of additional demand for agricultural commodities and their better utilization. The latter has the added advantage of simultaneously reducing commodity wastage in agriculture. Because of its linkages, the industry provides an economic incentive for the modernization of agricultural activities and the improvement of rural economy.
6. Thirdly, the food-processing sector through preservation and longer shelf life increases the availability of food, which can be a significant factor in meeting nutritional needs and in particular growing urban demands. Its impact on food self-sufficiency or at least in reducing external food dependency is therefore obvious.

III. TOWARDS INTEGRATED DEVELOPMENT OF THE OILSEED-ANIMAL PROTEIN COMPLEX

8. The process of economic growth leads to an increase in per capita food consumption^{4/}, as evidenced both in Latin America and Asian countries. This has not, however, been so much the case of Africa. On the whole, the increase

^{4/} More information on trends and structure of food-consumption can be found in information and background papers, as well as the world-wide study on vegetable oil and fats.

of animal protein consumption in developing countries was higher than that of vegetable protein^{5/}.

9. Similarly the development of the food-processing industry can contribute to the strengthening of economic growth. This interrelationship is best supported through the promotion of an integrated approach at the national level to the development of the food processing sector. In order to illustrate that approach, the example of oilseed-animal protein complex has been selected. Other examples also exist which could illustrate such an integrated approach, for example, aquaculture/fish protein complex, cereal/vegetable protein complex, etc., fruits, vegetable, canning, deep-freezing complex, etc.

10. The role attributed to the oilseed-animal protein complex can be summarized in the following main functions:

- Orienting national policy development including incentives for agriculture and industry;
- Moving towards national autonomy in availability of domestically processed vegetable oils and fats, animal feed, meat and dairy industries;
- Development of the agricultural sector and associated services through the expansion of demand for agricultural commodities.

11. The oilseed-animal protein complex consists of a set of activities linked through techno-economic relationships^{6/}. Its operation is based on:

^{5/} See: Background paper on "Differentiated approach for the industrialization of food processing in developing countries" document ID/WG.427/3.

^{6/} Greater detail of the type of relationship existing within the complex is presented in the background paper "Context and potential benefits of food-processing development in developing countries" document ID/WG.427/4.

- The creation of a closer link between vegetable and animal products through the animal feed industry;
- The industrialization and standardization of stock-raising techniques;
- The extension of processing agricultural commodities within this complex to include non-food items such as fuels, chemicals or pharmaceuticals^{7/}.

12. The integrated approach as illustrated by the above example aims at optimizing production through:

- Elimination or reduction of bottlenecks in the oilseed-animal protein complex;
- Identification of national actions needed to accelerate the development of this complex;
- Monitoring the development of the complex, as a whole, and timely introduction of corrective measures resulting from changes in economic and market conditions.

IV. THE COMPLEX AS A DIVERSIFIED TECHNO-ECONOMIC MODEL

13. The oilseed-animal protein complex, based on two agricultural commodities, i.e. maize and soya, is but a model that can be adapted to integrated food processing. Such a complex can also be based on different agricultural commodities input, notably on other cereals, oilseeds as well as pulses and tubers.

14. The oilseed-animal protein complex based on maize and soya was exclusively used in many developing countries in the production of poultry meat. It has also found some application in the production of pork meat and to a lesser degree in the production of bovine meat and dairy products.

^{7/} More detailed information is included in the information paper on "Downstream processing activities in vegetable oils and fats industry" document ID/WG.427/1.

15. As mentioned, components other than maize and soya, can also be used to produce animal feed, which is one of the mainstays of this complex. It would also enable developing countries to achieve a higher degree of self-sufficiency in processed food through the growth of domestic agricultural production and its transformation. Such a development would stimulate the local availability of other agricultural commodities.

16. Countries which cannot increase the production of these agricultural commodities could alternatively import and convert them into animal feed through domestic processing. This in turn could be utilized to raise the production of animal protein. However, their level of self-sufficiency in animal protein would remain partial because of their dependence on imported agricultural components.

17. Apart from the above commodity aspects, there are other essential elements of the oilseed-animal protein complex, such as:

- Mastering the technological processes;
- Controlling prices and markets;
- Creating stability through long-term marketing policies;
- Applying vegetable and animal genetics to breeding techniques;
- Improving nutritional techniques through substitution of agricultural and agro-food materials.

18. The ability to control the above mentioned strategic elements is essential for the effective utilization of the complex as a means of implementing the integrated approach. However, lack of mastery of these elements can be overcome, whenever possible, by their indigenous development or by their gradual acquisition through international co-operation.

V. PROSPECTS AND POSSIBLE AREAS OF INTERNATIONAL CO-OPERATION

19. International co-operation in this industry, both North-South as well as between the developing countries themselves can be furthered through prevailing economic complementarity.

20. Industrialized countries need to co-operate with developing countries because of existing overcapacity, which explains the strong interest in maintaining the exports of their industrial and agricultural products including services. In addition owing to scientific and technological progress, they are more keen to promote the sales of technology and know-how, rather than of products and equipment.

21. Developing countries need to co-operate with the industrialized countries and also among themselves to produce more processed food. They also need to maintain or develop the export of their supplementary food products, mainly tropical food to the industrialized countries, as a source of foreign exchange. Above all, such co-operation would help them to master all the important elements in integrated development of food processing.

22. The specific areas in an integrated development of the oilseed-animal protein complex (and with certain modification in other such complexes), in which international co-operation could be especially desirable, are:

- Improving oilseeds and fruits to achieve optimum fat or oilmeal content;
- Mastering better breeding techniques in meat and milk production ;
- Building adequate storage and transportation facilities to extend the period of safe-keeping of raw material, semi-finished products and final food products;
- Organizing efficient systems to ensure regular supplies of raw material and intermediaries;
- Improving animal food rations on the basis of a wider use of local resources;
- Introducing more efficient nutritional techniques, allowing for interchangeability among agricultural and agro-food materials, including a new range of products;

In particular:

- Mastering processing techniques which facilitate the valorization of by-products and co-products for food and non-food use;
- Managing processing plants, including procurement, maintenance and repair of machinery and equipment;
- Initiating of long-term marketing and distribution policies, including studies of changes in food consumption patterns.

23. The range of potential international partners, who could be interested in international co-operation in the above mentioned areas, is very wide. Their selection will naturally depend on their experiences, technological achievements and techno-economic conditions. Special attention needs to be drawn to agro-food co-operatives whose activities are connected both with agricultural and industrial sectors. This question is separately discussed in Issue 2.

VI. POINTS FOR DISCUSSION

24. In light of the above considerations, participants are invited to consider:

- (i) The degree to which an integrated development as illustrated by the case of oilseed-animal protein complex can be regarded as an efficient way of increasing processed food (a) in countries where agricultural commodities are available and (b) in countries where they have to be imported.
- (ii) What policy measures should be adopted by developing countries to promote food-processing based on diversified models such as oilseed-animal protein complex?
- (iii) Which forms of international co-operation could be offered by the various possible partners from developed countries?
- (iv) How could Governments of developed countries stimulate such co-operation?
- (v) How could the Governments of developing countries stimulate international co-operation (a) with industrialized countries and (b) among developing countries themselves?
- (vi) How could UNIDO promote the concept of the integrated approach to food processing, and stimulate international co-operation in this field?

ANNEX I

Information Papers

1. Downstream processing activities in vegetable oils and fats industry ID/WG.427/1
2. Problems of development of the dairy industry in developing countries ID/WG.427/2
3. Some aspects of the world white meat sector ID/WG.427/5
4. Problems of the red meat industry
5. Performance and integrated approach to development of the vegetable oils and fats industry



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ISSUE NO.1

AN INTEGRATED APPROACH TO FOOD PROCESSING:
VEGETABLE OILS AND FATS, ANIMAL FEED,
MEAT AND DAIRY INDUSTRIES

ADDENDUM

Sub-issue

Ways to improve capacity utilization
in the vegetable oils and fats industry
in the developing countries*

prepared by
the UNIDO secretariat

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Summary

Issue No.1 deals with actions for improving food self-sufficiency in the developing countries, applying the integrated development approach to the oil-seed animal protein complex, as an example.

The present sub-issue presents the problem of under-utilization of industrial installed capacity in the vegetable oils and fats subsector in the developing countries, a component of the oil-seed animal protein complex. Concrete policy measures to counteract the problem are proposed for discussion.

I. Under-utilization of crushing capacity in developing countries

1. The study on the vegetable oils and fats industry in developing countries, prepared as a background paper for the present Consultation,^{1/} indicates that industrial capacity utilization in the developing countries is a great deal lower than in the rest of the world.^{2/} For the three developing regions studied, average capacity utilization at the crushing stage was found to be 32 per cent in Africa and 51 per cent in Latin America with minimum values as low as 15 per cent for individual countries, while in the developed countries levels of capacity utilization are generally between 65 and 85 per cent. This situation cannot be interpreted as an excess of installed capacity in relation to demand in the developing world, for there is not a saturation of the local market of vegetable oils and fats; it is rather a question of under-utilization of capacity.

2. Processing margins at the crushing stage are generally low. Thus, it is necessary to utilize installed capacity at a maximum in order for the industry to operate under profitable conditions. However, often, the industry is able to continue to operate under economically artificial conditions without having to face competition in a market that is under short supply because of distortions in pricing of the raw materials and of the final products, resulting from government policies and a lack of proper application of quality standards for oil and oil products.

3. A wide range of economic and technical factors affecting crushing capacity utilization have been identified.^{3/} Low capacity utilization is registered both in oil surplus and deficit countries. One of the main causes of existing capacity under-utilization in oil deficit countries is the lack of proper integration between the existing crushing plants and the raw

1/ The Vegetable Oils and Fats Industry in Developing Countries: Outlook and Perspectives, Sectoral Studies Series No. 13, Vol I, UNIDO/IS.477, July 1984.

2/ Ibid., chapter 5.

3/ Ibid., chapter 6.

materials production on one hand and between domestic and export markets on the other.^{4/} Such integration would facilitate continuous, regular raw materials supply and sales of the oil and meal, the two products of crushing.

4. In those developing countries, where the constraints related to securing raw materials have been overcome through different mechanisms,^{5/} mostly oil surplus countries, under-utilization of capacity probably is the result either of poor industrial planning or the lack of proper monitoring of promotional industrial policies and programmes.

5. There is often a lack of comprehensive policy for the development of the sector, both in oil surplus and deficit countries. Policies affecting production, processing and consumption are frequently handled by different government offices, impeding the establishment of an integrated national policy and the monitoring of different policy components.

6. Among the technical constraints to capacity utilization, maintenance and the availability of spare parts are among the most important factors.^{6/}

II. Possible lines of action for improving capacity utilization

7. There are several policy measures that could be taken to correct the present gross under-utilization of industrial capacity at the crushing stage in developing countries. This would require active participation of different industrial and governmental bodies and institutions, both in developing and industrialized countries, which interact in the system of vegetable oils and fats industries. Some of these possible lines of action are outlined below for the consideration and evaluation of the participants.

^{4/} Ibid., chapter 6.

^{5/} Ibid., section 5 for a discussion.

^{6/} Ibid., section 6.2.3.

- (i) Avoidance, to the extent possible, of the establishment of new processing plants in the light of existing under-utilized capacity, while improving techniques to effectively monitor development-promotional policies.
- (ii) Creation of organizational, social, economic and financial conditions to ensure an adequate raw materials supply to the factories.^{7/} This entails both adequate pricing and credit facilities as well as an effective system to collect the raw materials from the growers.
- (iii) Development of adequate marketing mechanisms, including above all the implementation of quality standards and specifications, the establishment of brand names, the introduction of proper packages design and marketing and strategies for the local and international markets.
- (iv) Co-operation among developing countries to increase capacity utilization through joint ventures in the field of collection, trading and processing of seeds, marketing of oils and production of animal feeds at the bilateral and possibly at the subregional level.^{8/}
- (v) Promotion of the establishment of joint ventures between developing and developed countries for oilseed processing, utilizing already existing modern installations in the developing countries.
- (vi) Application of a co-ordinated integrated approach to the development of the vegetable oils and fats industry at the national level. This integration must extend from the provision of pre-harvest credit

^{7/} Ibid., section 5 of the study for examples of successful establishment of linkages between raw materials production and processing.

^{8/} Ibid., several successful examples of co-operation among developing countries are cited in section 5 and chapter 8.

through pricing and marketing of the end product. The possibility of extending co-ordination to a bilateral or subregional level should also be contemplated.

- (vii) Promotion of a proper organization of maintenance programmes at the industrial level, organization and guarantee of the procurement of essential spare parts, eliminating, whenever possible, foreign exchange constraints to the importation of essential spare parts. The possible opening of special credit lines in financing institutions to back-up the spare parts procurement to the developing countries should be considered as well as the possibility of establishing joint ventures for the local manufacture of components and spare parts. Thus, the integrated approach should also extend to the capital goods sector.

III. UNIDO's role

8. UNIDO can play an important role in supporting and assisting the various actors that have been identified. Possible UNIDO activities in this respect are:

- (a) Monitoring the development of capacity installation and utilization in developing (and also in industrialized) countries.

- (b) Providing and/or co-ordinating technical assistance to developing countries for the implementation of specification and quality standards of oil and oil products and other marketing support measures.

- (c) Promoting the application of a comprehensive integrated approach to sector planning of the vegetable oils and fats industry in oil surplus and deficit developing countries and make available instrumental procedures for the quantitative assessment of the sector, for policy- and decision-making as well as for the management of integrated systems.^{9/}

^{9/} A first attempt at a quantitative assessment of an integrated system in the vegetable oils and fats sector as well as of analyzing the impact of various policy measures and of establishing management mechanisms is presently being undertaken in the Andean Pact countries jointly by UNIDO and the Andean Pact Secretariat.

(d) Evaluating, in co-operation with the appropriate agencies in developing countries, different integration models or strategies for the sector.

(e) Promoting joint ventures - as outlined above - and other enterprises-to-enterprise co-operation measures, through its investment promotion activities.

(f) Studying the industrial links between the vegetable oils and fats industry and capital goods sector in order to increase the local industrial content in machinery and spare parts.

IV. Points for discussion

9. In view of the above considerations, participants are invited to consider:

(a) What type of participation could be expected from the industry to improve capacity utilization in oil surplus and deficit countries?

(b) How feasible is international co-operation in establishing marketing mechanisms and joint ventures?

(c) Under which conditions could industrialized countries co-operate with developing countries in the procurement and local production of spare parts?

(d) What could be the catalytic and supportive role to be played by UNIDO in enhancing co-operation along the proposed lines of actions?



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Issue No.1

AN INTEGRATED APPROACH TO FOOD PROCESSING:

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MEAT AND DAIRY INDUSTRIES

Corrigendum

Paragraph numbers 8-24 should be renumbered 7-23.

