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ASSISTANCE TO THE BANGLADESH FOOD

AND ALLIED INDUSTRIES CORPORATION.

DP/BGD/75/009.

BANGLADESH.

Terminal report.

Prepared for the Government of Bangladesh by the
United Nations Industrial Development Organization,
executing agency for the United Nations Development Programme

Based on the work of Ciri V. Skala, food industry specialist

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Explanatory notes

The monetary unit in Bangladesh is the taka. During the period covered by the report, the value of the taka in relation to the United States dollar was $US 1 = taka 15.04.

1 lakh = 100,000; e.g., 4 lakh lb = 400,000 lb

A slash between dates (e.g. 1977/78) indicates a crop year or a financial year.

References to "tons" are to metric tons, unless otherwise specified.

BSFIC or Corporation refers to the Bangladesh Sugar and Food Industries Corporation.

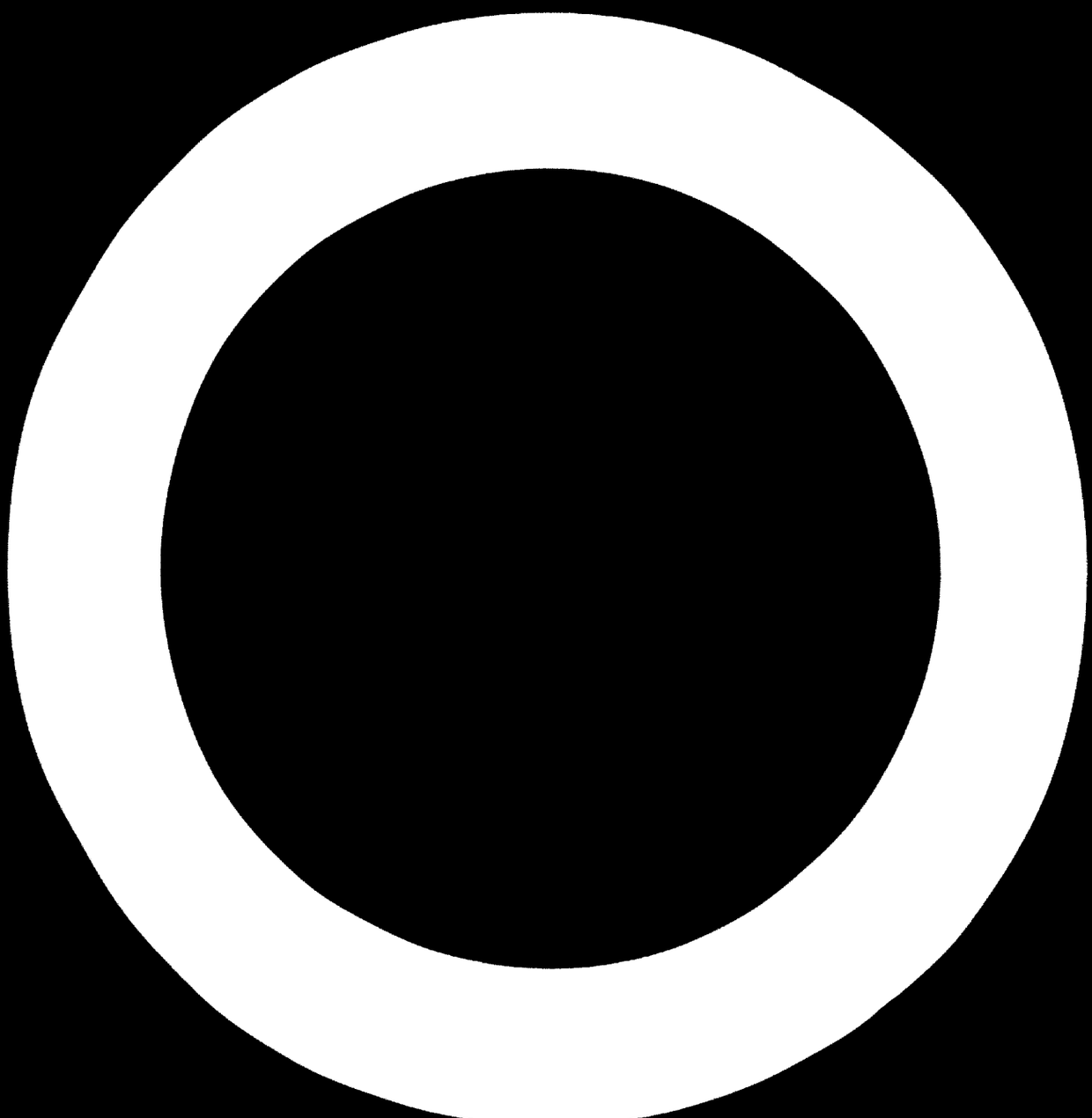
ABSTRACT

The project "Assistance to the Bangladesh Food and Allied Industries Corporation" (DP/BGD/75/009) was begun in June 1978 and lasted for six months. The United Nations Industrial Development Organization (UNIDO) was the executing agency.

The duties of the expert were to visit a number of Units of the Bangladesh Food and Allied Industries Corporation and recommend methods of improving their managerial and operational functions.

His recommendations included:

1. A central laboratory should be established which could:
   (a) Improve communications between the individual units;
   (b) Standardize production processes;
   (c) Improve quality and production standards.
2. An effort should be made to increase the supply of shrimps and frogs to the processing units.
3. A study should be carried out on the utilisation of turtles, in which the area abounds.



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INTRODUCTION

The project "Assistance to the Bangladesh Food and Allied Corporation (DP/BGD/75/009) was prepared in September 1976 and the actual work started in June 1978.

Within this period Bangladesh went through further economic development that influenced the structure and organization of the scheme as well as the production programme and the total number of production units incorporated with the Bangladesh Sugar and Food Industries Corporation (BSFIC).

Some of its plants were taken over by private entrepreneurs including all of the cigarette manufacturing units, some oil processing units and one cold storage unit. In June 1978, there were 36 production units altogether in the food wing of BSFIC. These were as follows:

5 fish processing units
3 cold storage units
9 miscellaneous units
17 vegetable oil processing units
2 salt-crushing factories

During his stay in Bangladesh, the expert visited 26 production plants (annex I), that is 72% of all the units belonging to BSFIC (annex II).

At the request of the management of the planning division of BSFIC, the expert carried out first, a prefeasibility study on a pineapple processing plant at Rangamati and secondly a prefeasibility study on a fruits and vegetables canning unit at Rajshahi.

In October, the expert met with some difficulties, hampering the progress of his work schedule, owing to a long strike by the employees of the Corporation involving changes in the management including that of the counterpart. Therefore some of the work was not completed.

As agreed to in the work schedule the expert visited the plants located at Dacca, Chittagong, Khulna and Bagwa and reviewed their production technology and technical and organization level.

Since the project started in 1976, the organizational, technical and planning levels of the production plants have improved significantly, and the majority of the production units now achieve their targets.

The main reasons for the non-fulfilment of production targets are the short supply of raw materials and disturbances in the supply of electric power. These difficulties are encountered mainly in the fish processing units, vegetable oil processing units and some miscellaneous units.

The production units are presently managed mostly by capable, well-trained educated and determined managers. The technicians of the head office of the Corporation possess adequate educational qualifications and their technical knowledge is quite up-to-date. Thus they have the capability to develop these industries further by ensuring the production of quality products and maintaining production economy.

I. FINDINGS

Managerial and operational functions

Operational functions

The present fluctuation in economy (production losses) and quality is mainly caused by the variations in the technical level and adopted technology of different units. The vegetable oil group suffers mainly because of the adoption of inferior technology in certain units.

In the next stage of development of these food industries, the introduction of a higher control during production operations should be taken into consideration and the suggestions below are given for future guidance.

Quality standards. All the products being processed in this Corporation should have fixed quality standards. To support the production economy, introduction of production standards limiting the consumption of raw materials, ingredients and packing material is recommended.

Uniform production processes. To ensure uniform high quality of processed food products and the consumption of raw material in the most economical way, it is recommended that obligatory uniform production processes for each production unit and product be introduced.

Control laboratory. A well staffed and equipped control laboratory in the Head Office under the supervision of the head of production is also recommended. The staff of this laboratory should check and control the work of supervised production units.

The control laboratory would provide the most important analysis and quality tests of raw material when purchasing them from abroad and also ensure the quality of ready-made products. Regular and systematic checking and analysing of raw materials and processed food products will also increase their quality.

Managerial functions

Modern enterprises with central control of the production units usually divide the management according to professional functions into:

Production division
Technical division
Economic division
Commercial division

Each division is headed by a manager or deputy manager.

Provided the recommendations for the introduction of quality standards, production standards, uniform production processes and control are accepted, further production managing, planning and evaluation of results would be more exact and easier. A simple and effective way of recording operation and production results should be introduced.

Some production units are fitted with worn out machinery and equipment that hampers the output and is bad for production economy. Therefore, replacement and modernization of some production units should be carried out as mentioned in the recommendations.

Operational units

Fish group

The expert visited the five fish processing units belonging to the Bangladesh Sugar and Food Industries Corporation.

Amin Agencies Ltd. This unit has got an annual installed production capacity of 27 lakh lb. They used to process shrimps, frogs legs and other fish. Only about 60 per cent of the production capacity can be utilized because of the insufficient supply of raw materials. A cellar for storing packing materials was, due to erection faults, filled with water. Thus, not only could it not be used but also it has become an ideal breeding ground for bacteria and is a possible source of microbiological contamination. The walls of the cellar should be thoroughly checked to ascertain whether they can be water-proofed. Otherwise the cellar should be filled up with soils and sands and permanently blooked.

The wooden racks being used in the potato cold storage smelled bad because of oonstant wetting, whioh is not at all desirable because moulds and fungi may grow in them. The racks should be exposed to air and sunlight during the off season. Moreover, before storing potatoes these racks should be thoroughly washed and then soaked with a 5 per cent solution of chlorinated water.

Wooden boxes containing machinery parts for another oold storage have been lying in a store since the factory was taken over by BSFIC. These machines should be installed and utilized.

Bay Fishing Corporation. This unit has got an annual installed processing capacity of 42.00 lakh lb of fish, shrimps and frogs legs.

The factory was neat and clean. There is no special problem with the plant except the short supply of raw materials.

Eastern Fisheries Ltd. This unit has got an installed annual production capacity of processing 27.00 lakh lb of shrimps, frogs legs and other fish. They are utilizing about only 30 per cent of their installed production capacity owing to the shortage in raw materials.

The factory has been running with some worn out compressors about 16 years old that require replacement to avoid the risk of large-scale deterioration of prepared products in the cold room in case of a breakdown. These compressors do not maintain a constant standard cooling temperature in the cold chamber. The fluctuation of temperatures in the cold room may lead to enzymatic activity in the finished product.

Instead of installing hand-basins to maintain on tap a constant flow of chlorinated water for the workers to wash their hands, bowls of chlorinated water have been placed in the entry to the factory. This is not at all desirable and these bowls should be replaced by taps.

Bangladesh Cold Storage Ltd. This unit has got an annual installed capacity of 32.00 lakh lb. They process shrimps, frogs legs and other fish. The Chief Executive informed me that for the 1977/78 season they have achieved about 87 per cent of the annual production target fixed by the Government.

In certain stages of processing the fish they use water supplied by the municipal water supply service stored in a concrete reservoir. The water in the reservoir should be chlorinated to inhibit any possible growth of micro-organisms.

Although machinery and equipment were neat and clean, the walls of the production hall require immediate distempering with lime.

Some female workers wear saris while working in the unit, they should be provided with aprons or overalls.

A pilot canning plant was being erected to introduce production of canned fish and shrimps on an industrial scale. An all out effort should be made to make this plan a success because there exists a good chance of utilizing the unit for deep sea catches in the near future. For this purpose the unit should have the services of an international expert, to provide the Bangladesh technicians with suitable technical know-how, to develop a standard production method of canning fish and shrimps, and to establish quality control. To ensure the fulfilment of this programme the unit should be equipped with adequate laboratory facilities.

This pilot unit can be used to develop a method of canning soup made from turtles.

Fish export Ltd. This unit has an installed annual capacity of 27.00 lakh lb. It processes shrimps, frogs legs and fish. It has achieved about 66 per cent of the annual production target for the year 1977/78 fixed by the Government. The production is only hampered with lack of frogs and shrimps.

This unit is located far away from a main town and has no telephonic links with Khulna, thus suffering badly from the lack of communication between the units of Khulna i.e. BCSL and Fish Export Ltd. Moreover, it is sometimes required to instruct the trawlers carrying raw materials or finished goods from the factory. Hence the project should be equipped with wireless sets. Moreover, this unit has no trawlers for carrying the finished frozen products in cartons to ocean-going vessels and has to depend upon BCSL for this. However, the trawlers belonging to BCSL have no cold chamber, so because of the difficulties in loading and reloading the ship, some of the finished products are wasted. The expert suggests that this unit be provided with at least one trawler with a cold chamber.

During discussions with the chief executive and other technicians, the expert was informed that turtles are available in abundance in the region around the factory. The possibilities of processing turtle meat in cartons, canning the meat, and producing turtle soup were discussed. It was concluded that a study should be made on the proper utilization of turtle meat. Turtles can be processed from November to March which is the lean period for fish and shrimps. However, the market should be researched to find out which product would be most appropriate.

From turtles it would be possible to produce 30 per cent boneless meat, 5 per cent bones and 65 per cent shell. These skins and shells have very good export possibilities in countries such as the Netherlands and Hong Kong. The unit is presently purchasing turtle meat at taka 6 to 7 per lb and selling the prepared meat at around taka 11.25 per lb. Hence, it would be economically viable to fish for turtles. For this purpose aid could be sought from international organizations.

A block ice manufacturing unit with a capacity of tons per day is lying idle for want of some spare parts, namely, condensers, a receiver etc., costing approximately $15,000. There are possibilities for the sale of block ice at reasonable prices to fishermen and wholesalers for the preservation of fish and shrimps. Hence, this manufacturing unit should be supplied immediately with the necessary spare parts so that it can be utilized for the manufacture of block ice.

The factory is situated about 400 m from the bank of a river and as there is no transport facility for the unit there are great difficulties in procurement and delivery of various raw materials and finished products. Presently, transportation is by push-cart and other expensive methods and this problem should be tackled.

Conclusions and recommendations

Arrangements should be made immediately to ensure an adequate supply of shrimps, frogs legs and fish to the fish processing units for better utilization of the installed capacity. Bangladesh could earn a good quantity of foreign exchange by exporting.

The units should be provided with adequate laboratory facilities for testing raw materials, ingredients and finished products. At least two laboratories should be set up - one in the Chittagong Zone and other in the Khulna Zone to solve the above mentioned problems. Chittagong has got a branch of the BCSIR laboratory that may be immediately equipped with proper facilities to test the raw materials, ingredients and finished products that are necessary to ensure a quality production.

The fish-canning unit in BCSL requires expert guidance for the proper canning of fish, shrimps and turtle meat. Experts (one or more) may be sent

to this unit to offer basic guidelines for this purpose and to introduce the proper technology for canned fish, shrimps and products from tortoise, and also to render adequate training facilities to the technicians.

The quality of all the finished products should be standardized and the production inspector should frequently visit the units to ensure standard quality production.

The employees of the fish units should be medically checked regularly to ensure proper hygienic conditions.

Presently frogs are killed by adding solution of NaCl, $CaCl_2$ and chlorinated water, which is not only cruel but also creates a shock in the frogs prior to their death that considerably influences the quality of the meat by biochemical process. A more humane method of killing the frogs should be found, possibly by electric shock. This should be included in a research programme.

Unutilized portions of frogs

During the expert's visit to all the five fish processing units of BSFIC, he observed that a huge quantity of frogs legs are being processed by these units (about 350-400 tons per year). They only use the back legs of the frogs and the remaining portions (which constitute about 60 per cent of the whole frog) are thrown away. Thus, while processing about 400 tons of legs about 600 tons of frog parts are thrown away, which could be utilized as a protein source for cattle and poultry feed.

There are three ways by which these unutilized portions of frogs can be preserved, as follows:

(a) Freezing the meat as with fish and shrimps;

(b) Crushing, drying and milling into powder;

(c) Hydrolysis of protein by means of sulphuric acid, which immediately preserves the meat against micro-organisms and spoilage.

The first method is well known but has got the great disadvantage that the production cost is very high. As is the case with the second. The third method would be the most feasible because the processing requires very simple production equipment consisting of a crushing mill, mixing vat with stirrer, dosing pump and storing vats. The procedure is to crush the remains of frogs and shrimps, mix them with solution of sulphuric acid (or other acids) and store in vats

where the proteins will be converted into amino acids; the finished product could then be converted into a paste with a neutral smell. It should be noted, that the presence of sulphuric acid could be neutralized before being used as a feed for animals. Sulphur components are not harmful to animals as the sulphur and its derivatives do not stay in animal bodies.

The paste could be utilized for feeding chickens and ducks on poultry farms, and for other domestic animals.

The processing units could be installed in most of the units of BSFIC and other processing plants because of their comparatively low cost and simple operation, and in this way a huge amount of proteins could be properly utilized.

The realization of this project would contribute significantly to the national economy. Because of the shortage of time, it was not possible for the expert to perform an elaborate or closer study in this respect.

Oil group

Dacca Vegetable Oil Industry Ltd.

From the technical view point, this is one of the best refining units of BSFIC. The quality of the finished products is very good and comparable with the standard products from any other country. The expert checked the free fatty acid content of the oil which was 0.2 per cent. The refining unit was in a very good condition and the adopted technology thoroughly corresponds to that of the modern oil refining factories of the world. Store control procedure are quite good.

The expert suggests that the following improvements should be made to this refining unit:

(a) Oils and vegetable ghee are filled mostly into cans of 5 lb, 10 lb, 35 lb and 37 lb. These large cans are then placed in retail shops for selling. The oil should also be put into polyvinyl chloride (PVC) bottles holding 400-700 g. These small PVC containers could be sold directly to the customers without refilling at the retail shops. This would help to avoid chances of adulteration;

(b) The cutting edges of the screws of expellers are worn out and require replacement. The oil-seeds prior to charging into the oil-presses should be preheated to a temperature of 90°C, which will enable maximum recovery;

(c) Regarding the storage of ready products the cans should be put into wooden pallets and then stacked one upon the other which will increase the storing capacity;

(d) For better procurement of crude oils throughout the year from Chittagong port the unit should be provided with at least one barge (self-propelled, about 500-ton capacity) for transportation of crude oils

Balagamwala Vegetable Products

The production performance of this unit is not satisfactory. There are about 154 crushers (out of which at the time of the expert's visit 104 were working) with an average output of 4 tons of crude oils per day. From these crushers about 7.5 tons of oil cakes are produced per day. The oil content of the oil cakes is really high, about 8 per cent; attempts should be made to procure modern machinery to avoid such wastage.

The expert tested the free fatty acid (FFA) content in the oil and found it to be 0.2 per cent, and the quality of the oil was quite good. The quality of vegetable ghee was not good because it contained some oils. The reasons for the presence of liquid oil might be insufficient quantity of hydrogen or improper use of catalysts. The temperature of the cold room, which was supposed to be maintained around $4^{\circ}C$, was not maintained properly because of some difficulties. This should be checked.

In the bleacher, pressure cannot be maintained properly which indicates that there may be some leakage. Moreover, the number of filter presses is insufficient.

The capacity of the water cooling plant is also insufficient thus they have to use rather hot water for technological purposes, which is not at all desirable.

There are serious problems with the hydrogen production unit which is very old.

The voltage of each electrolyser cell should be two volts (theoretical voltage 1.23) concentration of electrolyte about 32° Baumé. The KOH should not contain chlorine, otherwise batteries are damaged. The KOH solution should be changed from time to time (say every 1000 hours); however, it has not been changed for the last 5 years. Distilled water of good quality should be used for the manufacture of hydrogen. The distilled water unit should be replaced by a new one. The surface of the batteries should be cleaned regularly to avoid any possible chance of short circuiting.

There is no equipment for testing the quality of hydrogen produced in the hydrogenation plant. The laboratory should immediately be equipped with such apparatus.

Al-Mustafa Industries

The refining unit is not a balanced one. For example the plant has got a neutralizer of about 16-ton capacity but the capacity of the bleacher is 8 tons and that of the deodorizer, approximately 6 tons. Attempts should be made to make this a balanced unit.

The solvent extraction unit is running short of trained technical staff. The cake-crusher machine is worn out and the crushing of cakes is done manually. There are some difficulties with the extractor. It was reported that the hexane condensing unit has some blocked tubes, which require immediate replacement. The loss of hexane is high (about 2%), but should not exceed 0.6 per cent. Regular maintenance of the condensing unit is advised. The finished meal powder, which in no case should exceed 1 per cent of oil, contains more than 1 per cent.

Oil is being sold to the soap manufacturers only, although if adequate technology could be made available and proper care taken at every step of production, this oil could easily be sold for human consumption at a good price.

Although the unit has an automatic boiler because of lack of some spares for the control panel it is being handled manually. Some of the tubes of the boilers also require to be replaced.

Although this is the only solvent extraction unit of BSFIC its capacity utilization is quite poor. For example, the unit was able to utilize 13.38 per cent and 23.13 per cent of its installed capacity (12,991 long tons) during the 1976/77 and 1977/78 seasons respectively. Oil cakes are being exported. The oil content of the oil-cakes from most of the units belonging to BSFIC is 8%-10%, which is quite high (it should not exceed 6%) and instead of extracting oils from all these oil-cakes, if they are exported the country is going to lose a huge quantity of oil and therefore money.

Hasni Vanaspati Manufacturing Co. Ltd.

This unit has an automatic boiler that is lying idle for want of magnetic contactors for the control panel. The boiler should be immediately commissioned to supply the production unit with the necessary quantity of vapour.

There are problems with the rectifiers, which should be removed. The unit has got no spare cells for hydrogen manufacturing unit; provisions should be made to supply the unit with all necessary spares.

The can-making unit has got a can-making plant that is running short of spares. Necessary spares should be provided with the unit.

Hasni Oil Mills, Babu Oil Mills and Ahmed Oil Mills

These are crushing units and are generally crushing rape-seeds, linseeds and mustard seeds. The oils are only sedimented to obtain the final product which is of inferior quality. The technology adopted in these units is quite old and consideration should be given as to how to make use of these units.

Conclusions and recommendations

Edible oils are essential foodstuff and play an important role in connection with human health. The products of Dacca Vegetable oil Industries, Hasni Vanaspati Mfg. Co.Ltd. and Balagamwala Vegetable Products are of good quality, but the products of other units are of much inferior quality (especially with respect to the FFA content, moisture content etc.). Attention should be given to improving the quality of oil from all the units into a standard quality equivalent to international standard.

The crushing units should be equipped with modern expellers with high capacity. Thus not only the space but the efficiency of expelling can be improved and the oil content in the cakes can be reduced. By solvent extraction, the oil content can be reduced to a minimum i.e. 1%. The rate of wastage is very high in most of the mills and this could be reduced if proper care is taken.

In refineries, when neutralizing the FFA by the addition of an excessive quantity of NaOH, fatty acids (which are not in free state) are also neutralized, hence an increased loss. Prior to the treatment of oil a sample of it should be analysed in the laboratory to ascertain the amount of NaOH that would be needed for the treatment. It is normal that wasted fatty acids may contain a maximum of 50% neutral fat, which means the loss in fatty acids when neutralizing oil should not exceed double the free fatty acids present in the oil. To cut the production losses, when neutralizing the vegetable oil the most exact dose of NaOH should be analytically determined. For this reason, all refining units should be equipped with good laboratories and trained staff.

If, by supplying laboratories with adequate equipment and trained staff, the annual wastage could be minimized to 140 tons, then about 230 tons of oil per year could be saved.

When purchasing crude oils, prices should be paid after examining the FFA content because the higher the percentage of FFA, the higher the wastage. During his short stay, the expert visited quite a number of representative units of the oil group, which contains about five refining units, nine crushing units and one solvent extraction unit. For the modernization of all these units a separate elaborate study should be worked out by an expert. During such a study, the possibility of adopting continuous neutralization process should be taken into account in order to increase further the yield of vegetable oil from the crude oil and from vegetable oils. In Bangladesh there is a good market for margarine and hard fats (enriched with vitamins). Assistance from international organizations may be sought for this purpose.

Miscellaneous groups

Nabisco biscuits and bread factory

This factory is one of the best factories of BSFIC and is utilizing its installed capacity properly, but there are some problems:

(a) Out of the three biscuit production lines, two are nearly obsolete with resultant inefficiency in production and high process loss. Also, these two lines can only produce two types of biscuits ("Assorted" on No. 1 and "Super" on No. 2) which creates marketing problems. These lines should be replaced with modern versatile lines to increase the production capacity and profitability of Nabisco;

(b) With the installation of a new bread-making factory (the Modern Bakery), it will be economically justifiable to stop production of bread in Nabisco. Moreover, in Bangladesh there exists a very good market for toffee and candy. Hence, the floor space being utilized for the production of bread may be used for the installation of modern, efficient equipment for the production of toffee and candy;

(c) The Management of the Corporation and of the Factory should study the possibility of minimizing the number of products to find the most economical ones and to concentrate on them. They should also study the material handling problems in the various stages of production and packaging for which a huge labour force is utilized;

(d) It is recommended that in the store of finished products wooden pallets should be used. This would increase the storing capacity and flexibility in material handling;

(e) To maintain quality, constant vigilance is needed. Moreover, factory management should consult leading manufacturers from abroad on how to improve the quality of their products.

K. Rahman and Co. Ltd.

This plant has got four separate production units: beverage; ice cream and lollies; plain ice; and potato cold storage unit. There is another unutilized recombined sweetened milk line. A separate study has been done by the expert on this milk line.

The beverage plant is an old one with a small capacity. As this type of plant is out-dated, spares are not available. Moreover, during the peak season it could not cope with market demand owing to its small production capacity. This plant should be replaced by a modern plant with increased capacity of about 9,000 to 11,000 bottles per hour to meet the increased market demand. The carbonization of soft drinks was found to be correct as the content of CO_2 exceeded 7 g per litre of soft drink.

The compressors of the cold potato storage are worn out and not reliable so these should be replaced by new compressors.

The existing boiler has a capacity of 150 kg steam per hour, which does not fulfil the needs of the present production. This boiler should be replaced by a new one, the capacity of which should be determined after deciding whether a new production line for condensed milk will be installed, because the milk plant will have some evaporators.

Argosy Conserves

The present production programme of this unit is quite wide. They produce a wide variety of products, namely, fruit juice, fruit in syrup, fruit pulp, chutneys, pickles, ketchup and canned fish. The future production programme should be determined when it is known whether the proposed fruit processing industries at Rangamati and Rajshahi will be commissioned. This unit should concentrate on the production of a limited number of products. If the above-mentioned industries are commissioned, then it should cease production of pineapple juice, pineapple in syrup, mango pulp etc., and a suitable production programme should be chosen for it.

Diamond Food Industries Ltd

This is a unit with modern technology and a production capacity of 30,000 tons. The condition of the factory is quite nice. The grooves on the

rollers of mill tandems are totally worn out and should be regrooved in the workshop. The utilization of the production capacity depends on the supply of raw material and electric power. Hygienic conditions are properly maintained in the unit.

Chittagong Flour Mills Ltd.

This is a good unit with modern technology and a production capacity of 24,000 tons. The condition of the factory is quite nice. The grooves on the rollers of mill tandems are worn out and should be regrooved in the workshop. The utilization of the production capacity depends on the supply of raw material and electric power. Hygienic conditions are properly maintained in the unit.

Jubilee Flour Mills and Noorani Bread and Biscuit Factory

Jubilee Flour Mills has got a production capacity of 2,000 tons, its equipment is old fashioned. This factory is running short of raw materials and electric power.

Noorani has got a production capacity of 1,930 tons. It has got a Japanese oven that is run by electricity. The oven is in good condition and produces products of good quality. The plant has no proper mixing machine for a homogeneous mixture of ingredients. The production line should be equipped with a proper store for ingredients, a laboratory to make essential analysis of raw materials and prepared products. The production line should be provided with the relevant packing machine to increase the hygienic level of these products. The quality of prepared products was found to be good. The unit is running without any qualified technician, which is not desirable. Immediate steps should be taken to provide the factory with technically qualified personnel.

Bogra has got about 60,000 inhabitants, but there are neither any good flour mills nor any biscuit or bread manufacturing units. The possibility of establishing a good flour mill and a modern bakery on the site of the existing flour mills and Noorani Bread and Biscuit Factory is very good.

Can-making and tin-printing unit

This unit was erected very recently but up till now could not be put into operation as there is no industry that could utilize its products. The plant

is equipped with up-to-date machinery and equipment for the production of empty cans in measures corresponding to common international standards. But the plant is not equipped with machines for the production of 5 kg cans. The production unit should be completed with a line to enable processing of the lacquered cans that will be most desirable for utilization in the proposed fruit processing unit at Rangamati and Rajshahi.

There is lying idle a tin-printing line that should be installed in the factory, particularly for exporting some products of this country.

Edible salt

Special attention should be payed to the production of a better quality of edible salt (NaCl).

The salt-crushing units in Chittagong are concerned with washing crystalized sea-water salt, which contains beside sodium chloride (NaCl), potassium and magnesium salts, bromine, minerals and certain impurities. The quality of the processed salt is still not good because of the presence of the above-mentioned ingredients.

The developing industries will demand in future a higher quantity of good quality edible salt. Moreover, there is already a market for good edible salt.

To meet future demands, it is recommended that the developing industry and also the market be provided with a sufficient quantity of edible salt of adequate quality. At present, per capita annual consumption of edible salt is 10-15 kg.

II. RECOMMENDATIONS

The following are the main recommendations made by the expert, others are contained in the text under the relevant headings.

1. A central laboratory should be established which could:

   (a) Improve communications between the individual units;
   (b) Standardize production processes;
   (c) Improve quality and production standards.

2. An effort should be made to increase the supply of shrimps and frogs to the processing units.

3. A study should be carried out on the utilisation of turtles, in which the area abounds.

Annex I

JOB DESCRIPTION

Post title: Food industry specialist

Duration: Six months

Date required: As soon as possible

Duty station: Dacoa, with travel within the country

Purpose of project: To examine the situation and advise the Bangladesh Food and Allied Industries Corporation (BFAIC) on technical and economic improvement action to be taken in its various production units for better capacity utilization and overall improvement of its technoeconomic production efficiency

Duties: The expert, in close co-operation with the FAO Food Quality Control Expert, will specifically be expected to:

1. Visit and study a representative number of BFAIC's industrial production plants with regard to their organizational, managerial and overall economic situation and with regard to technical handicaps, bottlenecks and other factors preventing full capacity utilization and unfavourably influencing the factories technical and economic production efficiency

2. In close co-operation with the Board of Directors of BFAIC, review the organizational structure and managerial operations of the BFAIC top managements and the various factory management with specialemphasis to be laid on the flow of information, production control and otherwise managerial functions;

3. Review the processing technology presently applied and the production methods used in the various production units, the transport, storage, repair and maintenance, and other service facilities available and their functions.

4. Examine the qualifications of technical and other staff and labour available and comment on the type and nature of training requirements

5. Draw conclusions from the technical organizational and economic assessments and evaluation, and determine and specify the type and soope of improvement action to be taken within the framework of a UNDP/UNIDO follow-up technical assistance programme in co-operation with the authorities of the Government of Bangladesh

The expert will also be expected to prepare a final report, setting out the findings of his mission and his recommendations to the Government on further actions which might be taken

Qualifications: Food industry specialist with practical experience in industrial food production operations and knowledge in industrial planning and management activities

Language: English

Background information: The BFAIC is a public corporation supervised by the Nationalized Industries Division of the Ministry of Industries. It incorporates 39 different production plants, including 15 vegetable oil factories, 8 cigarette manufacturing units, 5 fish processing factories, 5 cold storage plants and 6 factories in the miscellaneous category, engaged in the production of wheat flour, beverages, biscuits and confectionery. The 39 factories employ about 5,000 persons, which is approximately 20% of the total number of persons employed in this sector of industry.

The Corporation plays an important role in the country's food production sector with regard to both internal food supply and exports and there is considerable scope for import substitution. However, as it is the case throughout the industrial sector, capacity utilization is extremely low, varying between 11% and 27% in 1972/73 compared with a rate varying between 22% and 55% in 1969/70. In several factories much of the capital investment is inoperative for lack of foreign exchange to guarantee the required sparepart supply. There is a critical lack of managerial and technical expertise because most of the senior posts before independence and nationalization were held by non-Bangalese who have now left the country

In order to maintain and increase exports, improved quality control measures need to be introduced. The Corporation therefore wishes to establish a central quality control laboratory which is expected to play an important role in process and product quality control activities with a great impact on the improvement of the operations of the Corporation's individual factories

Special importance is being attached by the Government to the optimum utilization of local raw materials by the development and establishment of viable processing industries and particular attention is paid to the food industry in this connexion. The Government therefore wishes to make use of the services of experienced UNIDO specialists for the definition and formulation of a specific UNIDO assistance project for the technical development and economic improvement of the Bangladesh Food and Allied Industries Corporation

Annex II

UNITS OF THE BANGLADESH SUGAR AND FOOD INDUSTRIES CORPORATION VISITED BY THE EXPERT

Fish group

Bay Fishing Corporation Ltd.
154, Jubilee Road
G.P.O. Box No. 279
Chittagong

Eastern Fisheries Ltd.
P.O. Airport
Patenga,
Chittagong

Amin Agencies Ltd.
Guptakhal
Patenga
Chittagong

Fish Export Ltd.
19, Mirzapur Road
G.P.O. Box No. 72
Khulna

Bangladesh Cold Storage Ltd.
P.O. Town Khalishpur
Khulna

Oil group

Dacca Vegetable Oil Industries
3 DIT Avenue (Extension),
Motijheel C/Area
Dacca

Hasni Vanaspati Mfg. Co. Ltd.

Balagamwala Vegetable Products Ltd.
7/8 Nasirabad Industrial Area
G.P.O. Box No. 613
Chittagong

Al-Mustafa Industries Ltd.
Sholashahar Industrial Area
Hathazari Road
P.O. Amin Jute Mills
Chittagong

Ahmedi Oil Mills Ltd.
Hathazari Road
Sholashahar Industrial Area
Chittagong

Babu Oil Mills Ltd.
282 Khatunganj
Chittagong

Hasni Oil Mills
Darogahat Road
East Modar Bari
Chittagong

Usmania Salt Crushing Factory
Strand Road
Chittagong

Dada Salt Factory
26, Strand Road
Sadarghat Area
Chittagong

Miscellaneous group

Nabisco Biscuit and Bread Factory
262, Tejgaon Industrial Area
Dacca

K. Rahman and Co. Ltd.
Baizid Bostami Road
G.P.O. Box No. 63
Chittagong

Argosy Conserves
213-A, Tejgaon Industrial Area,
Dacca-8

Diamond Food Industries Ltd.
290-291, Nasirabad Industrial Area
Chittagong

Chittagong Flour Mills Ltd.
5/6, Nasirabad Industrial Area
Chittagong

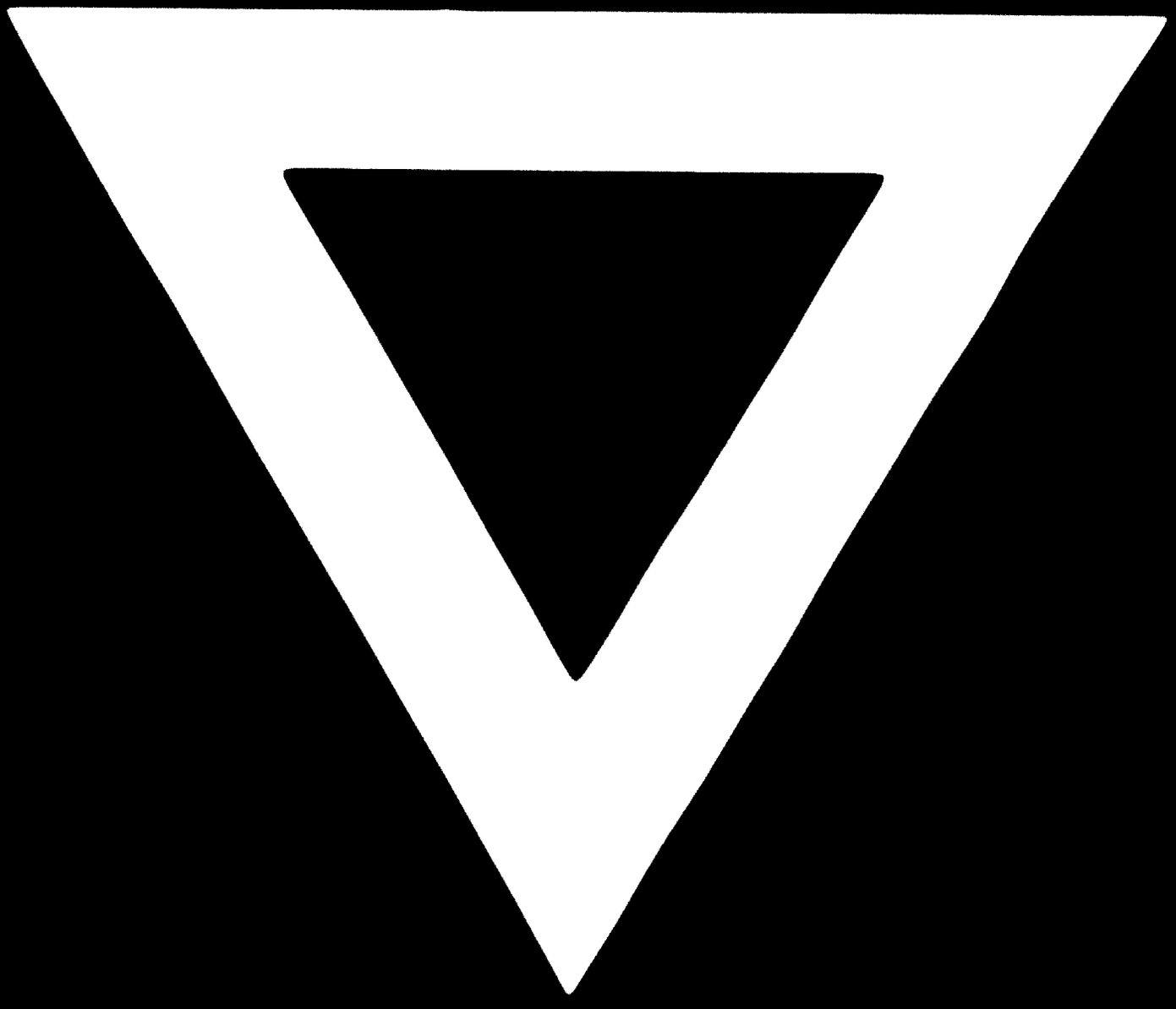
Noorani Bread and Biscuit Factory Ltd.
Santahar Road
Bogra

Jubilee Flour Mills Ltd
Santahar Road
Bogra

Modern Bakery
BSIC Industrial Estate
Tongi, Dacca

Can Making and Tin Printing Plant
181, Baizid Bostami Road
Chittagong

B-499



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