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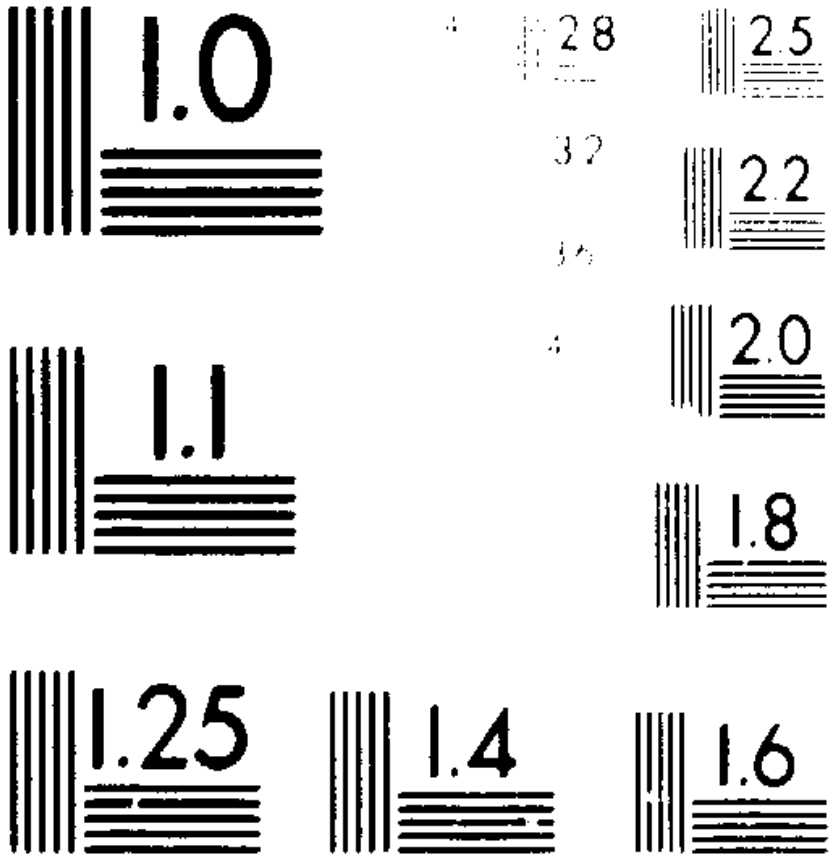

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15 June 1984
English/Spanish

STRENGTHENING OF THE MEXICAN INSTITUTE FOR ASSISTANCE TO [illegible]

[illegible]

Terminal report*

Prepared for the Government of Mexico
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

Based on the work of [illegible], chief technical adviser

United Nations Industrial Development Organization
Vienna

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I. INTRODUCTION

In 1972 the bases of an agreement between the Mexican Government, the United Nations Development Program - UNDP - and the United Nations Industrial Development Organization - UNIDO - were established to create the Mexican Packaging Institute (Instituto Mexicano de Envase y Embalaje - IMEE). This Institute would dedicate to the study, information, training, technical assistance and research and development of packaging in Mexico.

On April 17, 1977 the Mexican Institute for Assistance to Industry (Instituto Mexicano de Asistencia a la Industria - IMAI) was officially recognized. IMAI is the successor organization of the Mexican Packaging Institute with which it was merged.

For technical and budgetary reasons, all the Institute's activities, programmes and immediate plans were directed and carried out into the packaging area.

On July 1st. 1979, the UNIDO project started again with the title: Strengthening of the Mexican Institute for Assistance to Industry, Mexico City DP/MEX/78/011".

On April 1981, in order to orient the industrial development and as a consequence of the administrative reorganization, IMAI disappeared with all its personnel, equipment and laboratories, being integrated to the National Laboratories for Industrial Development (Laboratorios Nacionales de Fomento Industrial - LANFI), a public organism dedicated to research and technical assistance to the industry in the food, chemical and packaging areas.

II. OBJECTIVES AND LOGIC OF PROJECT

Bearing in mind Mexico's current programmes in the technological, industrial, economical and social development areas, taking into consideration the large share of the packaging sector in the industrial structure of modern industrialized countries, and recognizing the decisive influence of packaging in the protection and marketing of nearly all products, the following long-term objectives have been set for this project.

1 To help in keeping abreast of the latest development in the envolving technology of packaging in the country in order to provide direct support for industries producing and using packaging and for the orientation of the national programmes of industrial and economical growth in areas affected by packaging.

2 To promote the maximum use of such national resources in terms of raw materials, energy and manpower as may be used to produce materials for the manufacture of packaging, and to expand the packaging industry in a planned and logical manner, so as to enable it to satisfy the country's requirements.

3 To reduce to a technically acceptable minimum loss and wastage of domestic agricultural and industrial products between the time of their production and consumption, and to extend the distance that such products may be transported and the length of time that may be used to take advantage of the resultant social and economical benefits.

4 To contribute to the streamlining and rationalization of internal trade in domestic products by improving the conditions under which they are transported, stored, distributed and sold so as to ensure the lowest possible accumulation of costs at

all stages, from production to the consumer; to make possible reductions in the use of middlemen and jobbers; and, in general, to increase the transparency of marketing channels for consumer products.

The needs and importance of the consolidation of IMAI are presented in the section "Justification for the Project" of the project document with emphasis in the following:

A country's economic progress depends basically on its output of mining, agricultural and industrial products and on its relevant distributing and marketing systems. In each sector the technologies and systems in use have a direct effect on both the quantity and quality of the goods produced and on the costs that accumulate from the production to the consumption stage.

As a consequence, both the individual profitability of any given economic undertaking and its contribution to the total value of production in the country are closely linked to the level of that undertaking's technological advancement. This fact explains the concern of every country to ensure that the technologies it uses are kept up-to-date.

The more developed the country, the greater the importance given to the packaging sector, not only because of the role of packaging as such at the industrial level, but also - and mainly - because of its economic function in relation to nearly all products. Generally speaking, the purpose of packaging is to protect, complement and rationalize products by adapting them to specific conditions of transport, storage, distribution, marketing and consumption. Packaging also adds to both the value and cost of the content, so that its economic function referred to above has both a positive and a negative aspect. For all these reasons, the study and selection of the proper packaging is a highly specialized techno-economic matter.

In the specific case of Mexico it has been estimated that more than 20 per cent of the country's agricultural and industrial production is lost through technical defects in packaging for domestic sale. Promoting the development and actual use in the country of modern packaging technology to ensure that products are fully protected and suitably presented for their intended markets, represents in the ultimate analysis an increase in the value of production, which is in fact tantamount to increasing production.

Increase of production has been one of the present Mexican Government's principal objectives in the effort to curb inflation and its serious socio-economic implications. In view of the country's mixed economic system, this goal has been pursued through the formulation and application of the "alliance for production" principle under which the State is responsible for promoting, supporting and co-ordinating private initiative in the social and public areas for the purpose of achieving a real and substantial increase of production.

The strengthening of a national agency engaged in a country-wide programme of packaging research, assistance and promotion represents a concrete instance of State involvement to achieve progress in an important sector of the national economy. In keeping with the general thrust of the Government's present domestic policy, it is expected that this organization will concentrate its efforts on the priority area of agro-industry, with special attention to foods and other mass-consumption products.

The preparation of production programmes by vertically integrated branches has also been recognized as a priority task in ensuring the balanced economic growth in Mexico. With respect to the production of the basic materials for the manufacture of

packaging consumption and the short - and medium-term production capacity needed to meet it; the basic principle should be the maximum utilization of domestic raw material, energy and manpower resources rationally harnessed through the application of the appropriate technology.

In 1972 the foundation was laid for an agreement between the Mexican Government, the United Nations Development Programme (UNDP) and the United Nations Industrial Development Organization (UNIDO) on the establishment of the Mexican Packaging Institute (IMEE), an organization designed to deal with the problem of packaging in Mexico through research and studies, information, teaching, assistance and the promotion of new technologies. The project document for the establishment of this Institute, the official text of this agreement, was approved and signed by the parties between the months of October and December 1974.

Work on the IMEE project was interrupted towards the end of 1976 because its continuation had not been requested during the period of handling over powers between the outgoing and incoming Governments. At a later date, while in the process of drawing up its policies for its six-year term of office, the new Mexican Government requested UNDP to regard this project not as cancelled but merely as suspended until an official request should be made for its reformulation.

The over-all rate of project implementation in terms of budget utilization until the suspension of activities was 42.2 per cent, reflecting the combined negative effects of delay, firstly, by the national authorities in providing premises suitable for the Institute's laboratories and secondly by UNIDO in providing the equipment that had been finally specified and ordered in November 1976; that delay was due to the financial restrictions

imposed by UNDP at the beginning of 1976. As a result, the equipment component in the project budget barely reached the token disbursement level of 4.7 per cent, which in turn made it impossible to implement the part of the expert component related to work depending on the availability of this equipment. As a result, the personnel component of the project budget was implemented up to only 61.2 per cent.

The project which the Mexican Government is currently requesting under the title "Strengthening of the Mexican Institute of Assistance to Industry (IMAI)" is the result of a re-evaluation of IMAI's role in the context of the country's most pressing packaging requirements and the institutional ability of IMAI to play that role.

It should be pointed out, in this connexion, that the Mexican Government is assigning the highest priority to the improvement of food supplies and the establishment of small enterprises, recognizing that these enterprises are the most labour-intensive.

The Government's assignment of priority to the food sector emphasizes the importance of the National Consumer Necessities Distribution Company (CONASUPO), a Government body set up to purchase and distribute the principal staple foods to persons in lower income brackets.

III. ACTIVITIES CARRIED OUT AND OUTPUT PRODUCED

1. PLAN OF WORK

In general, the project was kept the same since it was programmed in the beginning. Because of the absence of the Project Manager in the first 14 months ,some changes occured in the plan of work mainly in the areas of training, experts and equipment, as discussed in the Project Progress Report of May 1981.

From the end of 1980 the plan of work became well established and deeply discussed in two tripartite meetings, in April 1980 and June 1981, with the two last budget revision approved. (ANNEX I).

2. CHIEF TECHNICAL ADVISER

Appointed August 22, 1980 until the end of the project, December 1981.

3. INSTALLATION

The total budget for equipment in this project was US$ 319,002.00 (ANNEX I) with all of them already installed. Based on the goals of this project and on the objectives of the institution, the laboratories,were divided in the areas of transport, metal, plastic, paper and corrugated board, packaging design, shelf-life of food products, market and economics and standardization.

The installation of these laboratories had a significant contribution of the Mexican Government. The Food and Packaging Pilot Plant was inaugurated by the President José López Portillo on October 27, 1981.

The year-end physical inventory 1981 of this project is presented in ANNEX II and some photographies of the main laboratories of LANFI are shown in ANNEX III.

4. TRAINING OF COUNTERPART STAFF ON THE JOB

Due to the present situation of LANFI with excellent facilities, laboratories and equipment, it was decided between the CTA, the Director of LANFI and the backstopping Officer/Section/Branch that training would be the most important activitiy of this project.

As said before, the activities were divided in the areas of transport, metal, plastic, paper and cardboard, shelf-life, marketing and economics and standardization.

The training of these groups was done in the following way:

- Internal seminars presented by the expert in the area.
- Round table with discussion of the main problems concerned to visits, projects or specific subjects.
- Work in the resolution of the industrial problems in LANFI Laboratories with the orientation of the experts and the CTA.
- Visits to the industries with the co-ordination of the experts, the CTA and leader counterpart.
- Seminars and courses given to the industries.
- Analysis of packaging materials in LANFI's laboratories.
- Preparation of plan of work (oriented by the experts) for the resolution of industrial problems as well as research studies in these areas.
- Resolution of industrial problems prepared by LANFI staff and oriented by the experts.
- Extensive courses presented by Michigan State University - MSU for LANFI staff.

5. TRAINING OF COUNTERPART PERSONNEL ABROAD

b.5.1 Lic. María Concepción García Martínez who works in the "Divulgation Department" received a very good training in the

"Centro Internacional de Perfeccionamiento Profesional y Técnico" in Turin, Italy, where she participated in the course "Sistemas de Formación, Metodología de la Formación y Tecnología de Medios Audiovisuales.

5.2 Ing. Donato Torres who works in the Standardization Department completed a good study tour visiting different institutions related to this area Standard Council of Canada, Standard Association of Canada, International Organization for Standardization, Instituto de Racionalización y Normalización de España and British Standard Institution.

5.3 Nury López Fraga, Technician who works in the area of standarization with the "Comité Consultivo Nacional de Normalización de Envase y Embalaje" received a training in the IRANOR (Instituto Nacional de Racionalización y Normalización de España) participating in the course "Normalización de Envases y Embalajes".

5.4 Ing. Alejandro Perales who works in the Laboratory of Transport of IMAI received a very good training in the Laboratory of the Technological Research Institute (IPT) of Brasil, in the area of Transit and Transport Package.

5.5 D.I. Carlos González who works in the Design Department of IMAI received a training in the Belgium Institute of Packaging participating in the course "El Embalaje y Condicionamiento en el Desarrollo Rural y la Promoción a la Exportación" He also participated on the 24th International Packaging Exhibition held from 17-22 November 1980 in Paris, France.

6 CONSULTANTS

The program of experts is based on the last budget approved (ANNEX I).

The following list presents all the experts that worked in Mexico
They are presented in chronological order with name, country, arrival date, departure date, specialization and technical report presented.

1 9 8 0

Name	Country	Date Arrival	Date Departure	Speciality	Technical Report Presented
Luis F.C. Madi	Brasil	Nov.10	Dec. 29	Laboratories	Project findings and recommendations
Colin Swinbank	England	Jan 3	Feb 28	Standardization	Packaging standards project. Findings and recommendations
Seymour Gilbert	USA	Jan 27	Mar 15	Flexible packaging	Production of flexible packages
Joseph Miltz	Israel	Jul 10	Sept 22	Plastics	UNIDO project in packaging. Mexico
Chaim Mannheim	Israel	Jul 11	Sept 24	Food Packaging	Packaging and preservation of fresh and processed foods in Mexico
Epigmenio Guzmán	Mexico	Aug.1	Oct 31	Paper and Board	Structural Design packaging course
Dora Boijseauneau	Mexico	Aug.1	Jan 31	Marketing	Marketing and consumer packaging design
Warren Parkinson	England	Oct 18	Mar 11	Metal packaging	Production of metal packages

1 9 8 1

Name	Country	Date Arrival	Date Departure	Speciality	Technical Report Presented
Luis F. C. Madi	Brasil	Aug 21	---(*)	Organization and coordination of the project	This report
David Reznik	Israel	Jan 21	Mar 15	Metal packages	Training a team to assist the can making and canning industry. First part of the mission
Ernesto Pichler	Brasil	Feb 16	Apr 15	Transport simulation	Method orientation for experimental research and development of transport packages
Bohdan Czerniawski	Poland	Mar 11	May 6	Plastics	Production of plastic packages
Karoly Lotz	Hungary	Mar 27	May 10	Economical aspects training	Economics and training in packaging
Frank Paine	England	Apr 2	May 27	Paper and cardboard	Production of paper and cardboard packages
John Salisbury	England	Apr 10	July	Standardization	Food package standardization
Seymour Gilbert	USA	May 17	June	Flexible packages	Flexible packages for food
Philip Turner	England	May 20	Aug 27	Marketing and design	Design marketing training programs
Joseph Miltz	Israel	Jun 2	Aug 17	Plastics	Plastic packaging
Ramón Catalá	Spain	Jul 14	Aug 13	Metal packages	Metal containers for food
Chaim Mannheim	Israel	Jul 16	Sept 21	Food packaging	UNIDO Project in Mexi
Frank Paine	England	Aug 18	Oct 6	Paper and cardboard	Paper and paper board packaging for transport and retail: production use and testing.

(*) Stayed in the continuation of the project

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1 9 8 1
Continued

Name	Country	Date Arrival	Date Departure	Speciality	Technical Report Presented
William Simms	USA	Sep 22	Dec 21	Methods and operations	Programs to consolidate LANFI from the technical and performance points of view with regard to its basic activities in the field of packaging, especially enlargement complemental and specialization of the institute's technological capabilities
Loa Karjalainen	Finland	Sep 28	Nov 17	Stardardization	Food packaging and standardization
David Reznik	Israel	Oct 26	Dec 5	Metal packages	Training a team to assist the can making and canning industry. Second part of the mission

7. INTERNAL SEMINARS

The most important activity of this project was the training of LANFI staff. One of the best ways to achieve this activity was through the presentation of internal seminars using the wide experience of each expert.

There were formed groups for the seminars according to the areas where some of them had the participation of 20 people of LANFI.

All the experts with no exception, presented seminars to the personnel in the following areas:

Luis F. C. Madi	Food packaging laboratories
Colin Swinbank	Standardization

Seymour Gilbert	Flexible packaging
Chaim H. Mannheim	Food processing and metal
Joseph Miltz	Plastics and transport
Epigmenio Guzmán	Paper and Board
Dora Boijseauneau	Marketing
Warren Parkinson	Metal cans
David Reznik	Metal cans and tinplate technology
Ernesto Pichler	Transport packaging
Karoly Lotz	Marketing and economical aspects
Bohdan Czerniawski	Plastic
Frank A. Paine	Paper and board
John Salisbury	Standardization
William Simms	Capacitation
Philip Turner	Design and Marketing
Ramón Catalá	Metal and Food Packaging
Loa Karjalainen	Standardization

8. SEMINARS AND COURSES FOR THE MEXICAN INDUSTRIES

It was found by the C.T.A. in many years of work in the Packaging Section of the Institute of Food Technology (Instituto de Tecnología de Alimentos - ITAL), Brasil, that one of the best ways to work together with the industry as well as to know its problems is through the presentation of Courses and Seminars for them.

This was done quite extensively in this project with the realization of the events with the participation of the experts in the field.

The Seminars and Courses organized during 1980 - 1981 were:

- "Seminario de Envases para Alimentos"
  27-29 August 1980, with the participation of Dr. Chaim H. Mannheim and Dr. Joseph Miltz. Participants 50 persons.

- "Seminario de Envases de Hojalata para la Industria de Alimentos"
  25-27 February 1981. with the participation of Eng. Luis Madi, Eng. David Reznik and Mr. Warren Parkinson. Participants 72 persons.

- "Seminario Diseño de Envases y Embalajes para Productos Alimenticios e Industriales"
  8-10 April 1981 with the participation of Eng. Ernesto Pichler and Dr. Karoly Lotz. Participants 28 persons.

- "Seminario Principales Aspectos Económicos relacionados con la Industria de Envase y Embalaje"
  7 May 1981 with the participation of Dr. Karoly Lotz. Participants 28 persons.

- "Seminario Control de Calidad para Fabricantes y Usuarios de Envases de Cartón Plegable y Corrugado"
  20-22 May 1981 with the participation of Mr. Frank A. Paine Mr. John Salisbury and Eng. Luis Madi. Participants 46 persons.

- "Seminario Uso de Envases Flexibles en la Industria de Alimentos"
  11-12 June 1981 with the participation of Dr. Seymour Gilbert, Mr. John Salisbury and Eng. Luis Madi. Participants 28 persons.

- "Curso Control de Calidad de Envases Metálicos para Productos Alimenticios - Curso Teórico-Práctico"
  5-7 August 1981 with the participation of Dr. Ramón Catalá , Dr. Chaim Mannheim and Eng. Luis Madi. Participants 29 persons.

- "Seminario - La Importancia del Diseño Gráfico en la Comercialización de Productos Envasados"
  11-12 August 1981, with the participation of Mr. Philip Turner. Participants 21 persons.

- "Seminario Papeles para Envoltura. Bolsas y Sacos. La Importancia de la Calidad del Papel y su Comportamiento como Envase"
  1-2 October 1981 with the participation of Mr. Frank A. Paine and Eng. Luis Madi. Participants 16 persons.

- "Seminario sobre Procesos de Envasado y Embalado"
  16-17 November 1981, with the participation of Mr. William Simms. Participants 15 persons.

In the Annex 4 it is presented the name of the companies that participated in these seminars and courses, with the total assistance of 333 persons.

9. FORECAST OF THE CONSUMPTION OF PACKAGING AND PACKAGING MATERIALS IN MEXICO

One of the most important activities in this project was the realization of the work "A short and medium term forecast for the consumption of packaging in the United Mexican States", carried out by PIRA, The Research Association for the Paper and Board, Printing and Packaging Industries, with the colaboration of LANFI through the Information Department

Through this work it was possible for the first time, to have an idea of the size of the Packaging Industry in Mexico as well as its main problems. This was not a complete work and need continuation. A final report was issued in April 1981 in English and by the end of the same year it was published in spanish and distributed to the main Mexican companies. A copy of the Summary of this work published in spanish is presented in Annex 5.

10. ORGANIZATION OF THE PACKAGING INFORMATION CENTER IN LANFI

In order to assist the Mexican Packaging Industry in a very effective way it is important to have at LANFI an Information Center.

Using the excelent experience that PIRA has had in this area, this institution was sub-contracted to organize and orient this Center. The mission was carried out from September 1980 to January 1981.

The results were presented in the final report prepared by Ms M.Y. Gates "Organization of the Packaging Information Center in the Mexican Institute for Assistance to Industry - IMAI".

The installation of the Center is expected by 1982-1983 with the acquisition of a computer by LANFI.

11. PACKAGING COURSES PRESENTED BY THE SCHOOL OF PACKAGING TO LANFI STAFF

In order to implement the training activities of the project and to increase the technical capacity of LANFI, the Michigan State University - MSU - through the School of Packaging was subcontracted to present two courses at LANFI:

1. Food Packaging Course.
2. Analytical Aspects of Packaging.

A final report of these courses was presented by MSU "Qualitative and Quantitative Improvement of the Training Courses on Packaging Material Production and Food Packaging Technologies. "

A summary of this report as well as the list of participants of LANFI personnel is presented in the Annex 6.

12. GENERAL TECHNICAL ACTIVITIES

Using the experience of the C.T.A., of the experts and consultants the main General Technical Activities were:

- Transport Laboratory.
  The majority of the equipment for this laboratory had been already ordered by the time that the C.T.A. arrived in Mexico. The major assistance was given in the construction of the laboratory and in the installation of the equipment ment . Eng. Ernesto Pichler and Mr. Frank A. Paine dedicated a good effort in this activity.

  Other important activities were:
  - Calibration of the sophisticated equipment
  - Elaboration of test methods to be used in the evaluation of packaging for transportation.
  - Review of the list of equipment necessary to complement this laboratory.

- Metal Laboratory.
  This laboratory did not exist by January 1981 and today is one of the most complete of LANFI. A great emphasis was dedicated to this area, using the experience of the C.T.A., Dr. Chaim Mannheim, Dr. Ramón Catalá and Eng. David Reznik.

  The most important technical activities were:
  - Purchasing of the equipment
  - Construction of some equipment
  - Installation of these equipment
  - Calibration of equipment and development of standard methods
  - Orientation of the research and assistance programs.

- Plastic Laboratory

  This area was considered one of the priority and was assisted by Dr. Seymour Gilbert, Dr. Joseph Miltz and Dr. Bohdan Czerniawski in the following activities.

  - Purchase and installation of equipment
  - Calibration of equipment
  - Development and adaptation of standard methods
  - Orientation of research and assistance programs
  - Preparation of the list of equipment to complement this laboratory

- Paper and Corrugated Board Laboratory

  This area had already a good experience at LANFI and did not need too much emphasis. Nevertheless Mr. Frank A. Paine and Mr. Epigmenio Guzmán dedicated a good effort in the following activities

  - Analysis of the equipment already existed and the list of the complementary
  - Review of the methods used in the analysis of paper and board
  - Preparation and orientation of Standards for these materials
  - Orientation of the research and assistance programs

- Packaging Design Laboratory

  This also was a very good installed department. Mr. Philip Turner and Ms Dora Boijseauneau assisted this department mainly in the orientation of the research and assistance programs

- Standardization Laboratory

  LANFI chairs the National Consulting Committee for Packaging Standards (Comité Consultivo Nacional de Normalización de

Envase y Embalaje - CCNNEE). This Committee is also integrated by representatives of governmental industry and research institutes and has produced more than 150 national packaging standards in the past five years. Consequently, a lot of emphasis was dedicated to this area with the participation of Mr. Colin Swinbank, Mr. John Salisbury and Ms Loa Karjalainen, with the following activities:

- Assistance in the structure of these Committees
- Assistance in how to get standards necessary for orientation
- Assistance in how to conduct a meeting with industries in these committees.
- Preparation of a list of priority standards for Mexico
- Review of the main standards already prepared by the CCNNEE.
- Assistance in how to prepare a Standard.

- Marketing and Economics Laboratory

In this area the major assistance was given by Dr. Karoly Lotz and Ms Dora Boijseauneau in the orientation of the assistance programs

IV. ACHIEVEMENT OF IMMEDIATE OBJECTIVES

In the project document was estipulated the immediate objectives of this project.

"The project will contribute to the technical and operational strengthening of the Mexican Institute of Assistance to Industry by improving the skills of its technical staff and providing equipment for services to industry and qualify control. Thus, it will have the following objectives:"

1. To carry out a general study covering consumption forecasts, installed production capacity and the additional capacity required over the short and medium term in the packaging industry

2. To improve equipment and provide training and start-up assistance for a general purpose packaging laboratory and a department to deal with the development and design of packaging appropriate national requirements

3. To expand and increase the degree of specialization of the packaging courses offered at national institutions.

4. To establish a specialized packaging information service to assist the interested branches of the national economy

5. To provide services for the Government and industry in improving the packaging of staple consumer items

6. To study various materials used in the packaging of staple consumer items

7. To promote standardization and quality control methods in respect of the packaging used for national products, with particu-

lar attention to fruit, vegetables and other staple foods.

8. To advise on development programmes related to the packaging industry, paying particular attention to the use of domestic raw materials

9. To provide a service to industry by which the quality and characteristics of packaging and packaging materials can be regulated.

10. To promote awareness of the importance of properly designed packaging in the industrial development process, and to support the work of Mexican designers.

By the end of the project, an appraisal of these objectives shows that almost all of them were satisfactory met by the following reasons:

1. The activity b. 9 shows the work performed in "A short and medium term forecast for the consumption of packaging in the United Mexican States". This is the most complete document of the packaging situation in Mexico, that together with the work carried out by the other experts gives an excellent idea of the situation of the Packaging Industry.

2. The list of equipment purchased in this project is presented in Annex 2. Besides this, the contribution of the Mexican Government was excellent and today LANFI is the most equiped packaging institute in Latin America. The Annex 7 presents a copy of the pamphlet of the project ONUDI-LANFI where shows the present situation of the project.

The most important activity carried out was the capacitation of LANFI staff as can be seen in the activity b.4 - Training of the Counterpart Staff on the job, b.5 - Training of the Counterpart Personnel Abroad, b.7 - internal seminars, b.8 - Seminars and Courses for the Mexican Industries and b.11 - Packaging Courses presented by the School of Packaging to LANFI staff.

Today LANFI has a very young staff with relatively good trainning in the packaging area and an excellent facilities.

3. From August 1980 to December 1981 it was presented 10 seminars and courses for the food and packaging industries with the participation of the experts and LANFI staff; activity b.8 - Seminars and Courses for the Mexican Industries. Today the institute has a series of good courses that can be presented to the Mexican Industry.

4. The Information and Projects Department (DIP) of LANFI has today a relatively good library with books and magazines on food and packaging. Nevertheless, this area should be improved with the acquisition of more books and magazines. A list of this material will be presented in the Recommendations of this work. In the activity b.10 - Organization of the Packaging Information Center of LANFI, is presented the comments of the work done by PIRA and the installation of this Information Center in LANFI is expected by 1982-1983.

5. LANFI has been working in a very close way with the industry and government agencies, providing assistance in the packaging area. Many works have been carried out with industries and government as CONASUPO, SAM, IMCE and other agencies.

6. Again many projects were done in this area
Another important work was the "Normalización de Envases para 39 Productos Agrícolas. Coordinación de Proyectos de Desarrollo de la Presidencia de la República"

7. Besides the fact that LANFI chairs the National Consulting Committee for Packaging Standards, it also has the chairman of three accreditation committees (Food Industry, Chemical Products Industry and Packaging Industry) of the National Testing Laboratories Accreditation System - SINALP.

The packaging committee works with paper and board, glass plastics, metals and handling and transport. This can show how helpful was the UNIDO project in this area.

8. Dr. Juan Antonio Careaga, General Director of LANFI is also the President of the Mexican Packaging Association working closely with the industries in the orientation of the use of domestic raw materials for packaging. Also, some departments as Cellulose and Paper have been working since long time ago in the use of domestic raw materials (fibers) for the production of paper in Mexico.

9. Already discussed in the item 5.

10. Seminars, meetings, visits and many work have been done in the area of the Packaging Design as already mentioned before.

V. UTILIZATION OF THE PROJECT RESULTS

In general, the basic idea of this project was to consolidate a Packaging Institute in Mexico in order to assist the National Industry and the Government, to establish a group of technicians specialized in this field using the LANFI facilities and laboratories.

At the end of 1981 the use of the project results could be summarized as follows:

1. TRAINING

   This was the most important activity of this project. The training area was divides as follows:

   - Training of LANFI personnel
   - Training of the Industry and other Institutions personnel

   The training of LANFI personnel had, as a major consequence, the increase of the technical conditions and better assistance to the industry

   Today the laboratories groups know how to deal, solve, orient and manage most of the problems regarding the packaging area

   Through the courses organized by LANFI, it was possible to train a number of technicians from the industry and other institutions. Other important point was the association of LANFI with other institutions such as: National Autonomous University of Mexico (Universidad Nacional Autónoma de México-UNAM), Mexican Food Technicians Association (Asociación de Técnicos en Alimentos de México - ATAM), National Council of Science Technology (Consejo Nacional de Ciencia y Tecnología - CONACYT), Mexican Graphic Designers College (Colegio de Diseñadores Gráficos de México - CODIGRAM); and with

international organisms as American States Organization (Organización de los Estados Americanos - OEA), Packaging Machinery Manufacturers Institute - PMMI and the Pan American Development Foundation PADF; to organize seminars and courses. In this way many persons national and international have been using the results of this project in the training area.

Some example of these associations is:

- OEA-CONACYT, "Packaging Latin American Courses" September 29 to October 22, 1980, with the participation of 15 persons from Latin America institutes.

- CODIGRAM-LANFI. The design in Mexico "Critical Analysis of the Developments and Perspectives" November 25-27, 1981.

- Government of the State of Sinaloa - ?PM - CONACYT - ONUDI - LANFI. "Technology utilization for the Processing and Packaging of Fish Products' Seminar. November 30 December 1-4, 1981

- UNAM-LANFI. Sterilization and Pasteurization of Food Products. February 24-26, 1982

Another important utilization of the results of the project was the participation of the LANFI personnel presenting lectures at seminars, courses, conferences, organized by other institutions in the packaging area. The participation of LANFI was:

1. "II Congreso de Ingeniería Industrial" February 1981 Guadalajara, Jalisco, Mexico

2. "Graphispack 81". March 1981. Barcelona, Spain

3. "XXI Reunión Anual de ATCP" May 1981 - Mexico

4. "Congreso Latinaomericano de Celulosa y Papel" June 1981 Torremolinos, Spain

5. "Semana del Ingeniero en Alimentos" July 1981. Mexico

6. "Seminario Latinoamericano sobre Comercios y otros esquemas de exportación" August 1981 - Mexico

7. "III Congreso Nacional de Fruticultura" August Guadalajara, Jalisco, Mexico

8. "Seminario sobre Seguros y Transportes" September 1981 Puebla, Puebla, Mexico

9. "Seminario Construexport" September 1981- Querétaro, Querétaro, Mexico

10. "IX Congreso Nacional de Control de Calidad" October 1981 Guanajuato, Guanajuato, Mexico

11. "VII Conferencia sobre Tecnología de Materiales" October 1981. Mexico

12. Papers presented in CANACINTRA. October 1981. Mexico

13. "XVI Congreso de la Sociedad Mexicana de Química Pura y Aplicada" November 1981. Mexico

2. ASSISTANCE TO THE INDUSTRY

This is one of the main goal of the project. Today the mexican industry is using LANFI laboratories in the packaging area in these three main activities:

1. Analysis and testing

2. Research work

3. Trouble shooting

A good indication of the consolidation of LANFI in the packaging area is the number of assistance rendered to institutions.

The following figures illustrate the increase of this activities.

Y E A R	NUMBER OF ASSISTANCE
1977	9
1978	26
1979	13
1980	44
1981	372

This shows that in 1981 LANFI was highly involved in the technical assistance with 372 orders.

Approximately 12% of this work was related to the organization of courses and seminars, training and paper presentation. 24% of this service was done to industries of the public sector and 26% to the private one. 83% of these services to the industry in the areas of design, chemical analysis, physico-mechanical tests, economic studies and technical economic studies. 82% was generated inside of the metropolitan area and 18% into the rest of the country.

The distribution of these services in the packaging area was:

1. Paper and cardboard	29%
2. Plastics	6%
3. Industrial Design	42%
4. Food Packaging	5%
5. Transportation	18%

Regarding to the budget contribution the division by areas were:

1. Paper and cardboard	13%
2. Plastics and metals	28%
3. Industrial Design	9%
4. Food Packaging	21%
5. Transportation	29%

3. STANDARDIZATION

As said before, LANFI chairs the National Consulting Committee for Packaging Standards - CONNEE - working in the following sections:

paper and cardboard
wood
glass
plastics
textiles
metals
technical studies
transport

The most important use that the industry and the country can have through the activity of LANFI in this area is through the standards prepared by these Committee and by the technical assistance for the implementation of these standards.

The Annex 8 presents the official standards in the Packaging area in Mexico.

4. TECHNICAL COOPERATION BETWEEN DEVELOPING COUNTRIES - TCDC.

One of the UNIDO's main emphasis has been on the establishment of national packaging research centers and institutes. This work has proceeded in India, Korea, Morrocco, Poland and Brasil. However, it is in Mexico where the major effort is being made. The program is regarded as a model that other nations can follow. The results will be closely studied. In time, many of those participating in the UNIDO/LANFI operations should be available as personnel for expanding the training programs not only in Mexico but also in other countries requiring assistance in improving food supply, better diets and more adequate packages.

Many agreements have been made with different countries with specific activities in the packaging area. Some institutions and countries that are using this TCDC are:

1. Brasil
   Institute of Food Technology - ITAL
   Campinas, Sao Paulo

   Technology Research Institute - IPT
   Sao Paulo, Sao Paulo

2. Cuba
   National Packaging Center
   Habana,

3. Argentina
   National Institute of Industrial Technology
   Buenos Aires

4. Marocco
   Marocco Packaging Institute

5. Guatemala
   Instituto Centroamericano de
   Investigación y Tecnología Industrial
   Guatemala, Guatemala

6. Chile
   Technological Packaging Institute
   Santiago

7. Nicaragua
   National Food Laboratories - LABAL
   Managua

5. PUBLICATIONS

Another good material that became available through LANFI was the publications of directories, documents, etc.

The most important were:

1. "Pronóstico a corto y mediano plazo del consumo de envases y embalajes en la República Mexicana"

2. "Directorio Nacional de Fabricantes y Proveedores de Envases y Embalajes"

3. "Directorio Nacional de Fabricantes y Distribuidores de Maquinaria y Equipo para la Industria del Envase y Embalaje"

4. "Solucionando Hoy los Problemas de Envase y Embalaje"

5. "Solving tomorrows packaging problems today"

VI. FINDINGS

1. CONSULTANTS

As pointed before, in the first 14 months of the project, there was no Project Manager or Chief Technical Adviser, therefore the names, lengths of time were suggested by the Project Co-Manager, Dr. Juan Antonio Careaga and the Back Stopping Office, Mr. Joao de Moura Ribeiro Belo.

After the arrival of the Project Manager it was agreed by the parts involved to have short mission and also split missions.

Following is the final list of the consultants in this project including that involved in the Sub-contracs.

NAME	COUNTRY	ARRIVAL	DEPARTURE	EXPERTISE
1980				
1. Luis F.C. Madi	Brasil	Nov.10	Dec. 29	Food Packaging Laboratory
2. Colin Swinbank	England	Jan. 3	Feb. 28	Standardization
3. Seymour Gilbert	USA	Jan 27	Mar 15	Flexible Packaging
4. Joseph MIltz	Israel	Jul 10	Sept. 22	Plastics
5. Chaim Mannheim	Israel	Jul 11	Sept 24	Food Packaging
6. Epigmenio Guzmán	Mexico	Aug. 1	Oct. 31	Paper and board

NAME	COUNTRY	ARRIVAL	DEPARTURE	EXPERTISE
7. Dora Boijseaunea	Mexico	Aug. 1	Jan 31	Marketing
8. Warren Parkinson	England	Oct. 18	Mar 11	Metal Packaging
1981				
1. Luis F.C. Madi	Brasil	Aug 21	Dec. 31	Organization and coordination of the project
2. David Reznik	Israel	Jan 21	March 15	Metal packages
3. Ernesto Pichler	Brasil	Feb. 16	Apr. 15	Transport Simulation
4. Bohdan Czerniawski	Poland	March 11	May 6	Plastics
5. Karoly Lotz	Hungary	March 27	May 10	Economical aspects training
6. Frank Paine	England	Apr. 2	May 27	Paper and cardboard
7. John Salisbury	England	Apr. 10	July	Standardization
8. Seymour Gilbert	USA	May 17	June	Flexible Packages
9. Philip Turner	England	May 20	Aug 27	Marketing and design
10. Joseph Miltz	Israel	June 2	Aug 17	Plastics
11. Ramón Catalá	Spain	Jul. 14	Aug 13	Metal packages
12. Chaim Mannheim	Israel	July 16	Sept. 21	Food packaging
13. Frank Paine	England	Aug 18	Oct 6	Paper and cardboard
14. William Simms	USA	Sept 22	Dec. 21	Methods and operations
15. Loa Karjalainen	Finland	Sept 28	Nov. 17	Standardization
16. David Reznik	Israel	Oct 26	Dec. 5	Metal packages

One very important aspect regarding to the consultancy was the length of time. Based on the experience got in this project it can be said that three months or more is too much for a consultant period. The best experience was between one and two months.

Here is very important to point out that a previous orientation of the expert is necessary. It is highly recommended that the experts that come to the project have some background information, some previous contact with the counterpaft, and know the present situation of the project and also of the institute.

Another very good experience was with the split missions. In the first part of the mission the expert get to know the group, the project situation, etc. Then leaves a specific program to be carried out for the time it will be out and when he comes again, make the follow up of what have been done by the group, reorganize the program and the work.

In almost all the cases, the consultant received the job description in Vienna and in the first week in Mexico, this program was adapted to the present situation. An example of the Job Description presented in the beginning and the modified version is attached in the Annex 10.

Today, for new project MEX/82/010 "Research and Development of Processing Technology and Packaging of Foods", the Job Descriptions were prepared by the C.T.A., the Counterparts and the Back Stopping Officer.

Due to the fact that LANFI, in the packaging area, has a considerable large group of technicians, it was possible to

form a specific group for each expert. In some cases, the expert works with groups of approximately 20 persons, but always with a responsability of only one leader.

The physical position of the experts was another interesting finding. The best situation was to have a central office together with the C.T.A., secretary, driver, etc. but also a place for the consultants together with the group of work. This allows much bigger interaction between the expert and LANFI personnel.

As said before the basic activities using the experts were:

- Visits to the industries
- Revision of the work programs
- Internal seminars
- Round tables
- Seminar to the industry
- Resolution of trouble shooting problems

One of the best results was obtained through the internal seminars where the previous contact and the round tables had an important influence. Many of the experts used a round table after visits to the industry and tried to see how much the LANFI personnel could see in the visit and then orient their work programs.

Another point that worked very well was to program a series of experts in some areas where one could follow and orient the work done by the previous one. This became very well in the Metal Packaging area.

2. SCHOLARSHIPS, BACHELLORSHIPS AND FELLOWSHIPS

This is one of the areas that could be improved if it has the opportunity to be included in the new project.

Scholarship and fellowship in general can be divided in two major areas: academic and practical or industrial. Each one has advantages and disadvantages. We think that when an institute is begining to train its personnel it is better to send them to receive an academic training as it was in this project. When you have a group of persons with a good idea of the area and also a solid background then is time to send them for an industrial training and it is recommended to go to local industries.

In this project with a budget of almost 1 million dollars it was spent only approximately 35,000 dollars in the training area. This amount should be improved for this size of project.

Any way, it was possible to give opportunity for five persons of LANFI, basically in the areas of training,standardization, design and transportation, all of them oriented to the academic and institutional training.

The list of them are:

No.	LANFI PERSONNEL	AREA	PLACE OF TRAINING	PERIOD
1.	Lic. María Concepción García Martínez	Training	Turin, Italy	Sept. 20 Dec. 15
2.	Ing. Donato Torres	Standardization	Canada, England Spain	Nov. 3 Dec. 3
3.	Nury López Fraga	Standardization	Spain	Nov. 3 Dec. 1
4.	Eng.Alejandro Perales	Transport	IPT, Brasil	Nov. 3 Nov. 28
5.	Ind.Design Carlos González	Design	Belgium France	Nov. 17 Dec. 22

The training of the counterpart or staff on the job and abroad was already discussed in the item b.4 and b.5 Meanwhile, there are other possibilities that could be explored as the use of mannuals, video-cassete and also movies for the LANFI personnel.

The situation in which LANFI is now, is not so important that the staff receive a training before or after the expert comes to the institute. The idea of working in groups, eliminates this problem, because you always will have somebody with enough knowledge to work together with the expert.

What is recommended is that the preparation of video for test methods and analysis, manuals, etc. should be prepared with the experts. The major reason for this is because knowing the situation of the research institutes it is understandable that time by time, people will leave and people will start to work. For these people that starts these materias are excellent and save a lot of time to the others. Besides this, these materials could also be used for the industrial people in a more effective way.

3. EQUIPMENT

The total budget for equipment, approximately US$320,000.00 was considered excellent for a project of US$1,000,000.00 Besides this, the project had a substantial contribution of the Mexican Government in this area.

By the time that the C.T.A. arrived in Mexico, almost 2/3 of the equipment had already been ordered. Nevertheless we

had enough time for the adjustment of the last requisition. The complete list of the equipment purchased in this project is presented in Annex 2.

The efficiency of the Purchasing and Contract Division of UNIDO in Vienna was very good and had an important influence in this area. Since not all the models suggested by the C.T.A. and Counterpart were purchased due to purchase procedures, it is recommended that a close contact should be kept between Vienna and Mexico to come to an agreement regarding the models to be bought.

It is important to emphasize that one of the most important equipment ordered through the project was the 4 chambers bought from Japan. The reason we are emphasizing this is because of the doubts we had to buy such important equipment from foreign companies with consequence in the maintenance of these equipments. The results are very good, having today Mexican companies in charge of the maintenance of these chambers.

Another important point is to have with the larger companies contracts for the maintenance of the equipments. This undoubtly would avoid many troubles regarding the breakage of equipment. This could be done with INSTRON, RIGAKO KOGIO, SENTINEL, MTS and others.

An important experience was obtained with the purchase of sophisticated equipment as the two Gas Chromatography bought from Perkin Elmer. They are sometimes too sophisticated and very delicate to perform some routine work. This could had been better if it was bought one sophisticated and one more simple model to perform simple work. This can be extrapolated to other areas in order to buy the equipment according to the work to be performed.

The insta'lation, energy supplier and so far were done in an excellent way that today, all the equipment purchased by UNIDO are installed and in condition to be used.

Some of the experts that came in this project did not have idea about the equipment that LANFI had. The point here is that it would be better if the experts that come to the project know in advance what equipment the institute has and what is planning to buy, in the way that they could come more prepared to do their jobs.

4. TRAINING

Again should be the concentration of the activities of the continuation of the project. At the end of the project, many people inclusive the former R.R. Daniel Jiménez and the new R.R. Gustavo Silva Aranda, praised the project because of the idea to develop in Mexico a highly trained staff in the area of packaging that also can now help other Latin American countries.

It was found that the internal training was excellent and should be continued, but it is also very important to establish a plan of rendery people abroad in order to get more formal training as master or even Ph D that, in a long range, would be very helpful for this project and for the institute.

5. INFORMATION AND PUBLICATION

As said in the item b.10 "Organization of the Packaging Information Center in LANFI", it is expected by the end of 1982 and beginning of 1983 to start the plan organized by

PIPA with the acquisition of a computer by LANFI.

It seems to be reasonable to start with a small center and with the time to expand according to the needs of the institution.

With the new structure of LANFI, Annex 10, where the Food and Packaging area now belongs to the same Deputy-Director, it is important to establish the Center in the packaging and food area.

In this matter it is necessary to implement the acquisition of books and periodicals in both areas. A list of this material is presented in Annex 11.

It was found that the publication of the materials produced in LANFI are too small The industries, mainly in the packaging area needs more information that LANFI can supply.

VII. RECOMMENDATIONS

1. CONSULTANCY

1.1 It is highly recommended that the consultant who comes to the project knows in advance the present situation as:

- Equipment available
- Personnel of the institute
- Background information (the pamphlet can be a good source)
- Work already done in the area
- etc.

1.2 Concerning the length of time, the best would be from 1 to 2 months with split missions when possible.

1.3 The physical place for the consultant together with the group of work gives a very good interaction.

1.4 It is important to analyze frequently the recommendations of the consultants.

1.5 It is recommended to inform the consultants to bring as much material as he or she can use in the project.

1.6 It will be important to continue the system adopted before, where the expert prepare the report before leaving the country.

2 · SCHOLARSHIP AND FELLOWSHIP

2.1 Today the fellowship and scholarship should be mixed between academical and practical (industrial) areas

2.2 The length of time for scholarship should be no more than one month and/or fellowship no more than 3 months.

2.3 A round table or even a presentation of the report in an open section for members of the institute with the supervisiong of ten experts is very good for a training activities.

3. EQUIPMENT

3.1 Today the project has the most sophisticated equipment necessary for its job mainly in the packaging area. Nevertheless it is necessary some accesories or less expensive equipment to complement the laboratories.

3.2 In the Annex 12 it is presented the complementary list for the packaging area

3.3 For the extention and orientation of the project in the food area it is also necessary some small equipments to complement the laboratories.

3.4 In the Annex 13 it is presented the complementary list for the food area

4. TRAINING LANFI PERSONNEL

4.1 The actual system for training of the LANFI personnel using the experts, sub-contrating M.S.U. or other institutions should continue.

4.2 By the other side, it is necessary to establish a program to send people abroad for more complete training as Masters or PhD.

4.3 A weekly meeting with a group where it will be discussed the major program of the activities, the work program and the results got in the projects, should be implemented in order to accelerate the training of the personnel.

4.4 It is strongly recommended a periodical visit to industry. This seems to be trivial, but most of the time the visits are programmed not in a systematic way

4.5 Video training should be adapted as well as the use of manuals, pamphlets, etc.

5. INFORMATION AND PUBLICATION

5.1 The distribution and dissemination of the information already obtained in LANFI should be implemented.

5.2 It is mandatory to establish an official bulletin

or magazine for the publication of LANFI works, information etc. The food and packaging industry needs too much these materials.

.5.3 The information centre with the arrival of the computer should start in a small operation and should grow accordingly to the needs.

.5.4 A review of the seminars, courses and even services done by LANFI, shows a heavy concentration in Mexico City. It seems them to be recommended to expand the propaganda of LANFI services to other part of the country.

6. BIBLIOGRAPHICAL MATERIAL

6.1 The LANFI library has a good bibliographical material in the food and packaging area, meanwhile, it is recommended to improve this with the acquisition of complementary material that is presented in Annex 11.

6.2 It is important to estimulate the LANFI personnel to use the library. One action that could improve this activities could be a monthly publication of the list of material that arrives to the library.

7. SEMINARS AND COURSES

7.1 The actual system used in this project, i.e., to have courses using the experts together with the LANFI personnel should continue.

7.2 It is highly recommended to extend the courses and seminars to other areas of Mexico as Monterrey, Guadalajara, Mazatlán, etc.

7.3 It is important to start some practical courses to the industry in order to teach laboratory techniques and other practical work, mainly to technicians.

8. TRAINING TO THE INDUSTRY STAFF

8.1 The way that the institute is growing, certain areas are becoming more structured. In these areas LANFI can start a service that is very helpful to the industry that is the training of the staff inside the institute. It is recommended to start to establish programs of training to the industry's personnel in different length of time as one week, one month, 3 months, and even 6 months.

8.2 This idea can be expanded to other institutes of developing countries.

9. AREAS OF PRIORITY OF WORK

The main areas of priority in the food and packaging fields are:

- 9.1 Shelf-life of food products
- 9.2 Lead and tin contend of canned foods
- 9.3 Analysis of the quality of the main packaging materials for food products
- 9.4 Establishment of the food pilot plant as instalation of steam, water, etc.
- 9.5 Sterilization of food processing
- 9.6 Accreditation laboratories in the food and packaging areas
- 9.7 Unitization and palletization of packages
- 9.8 Label contents
- 9.9 Retort pouch of food products (low and high acidity)
- 9.10 Nutritional aspects of food products

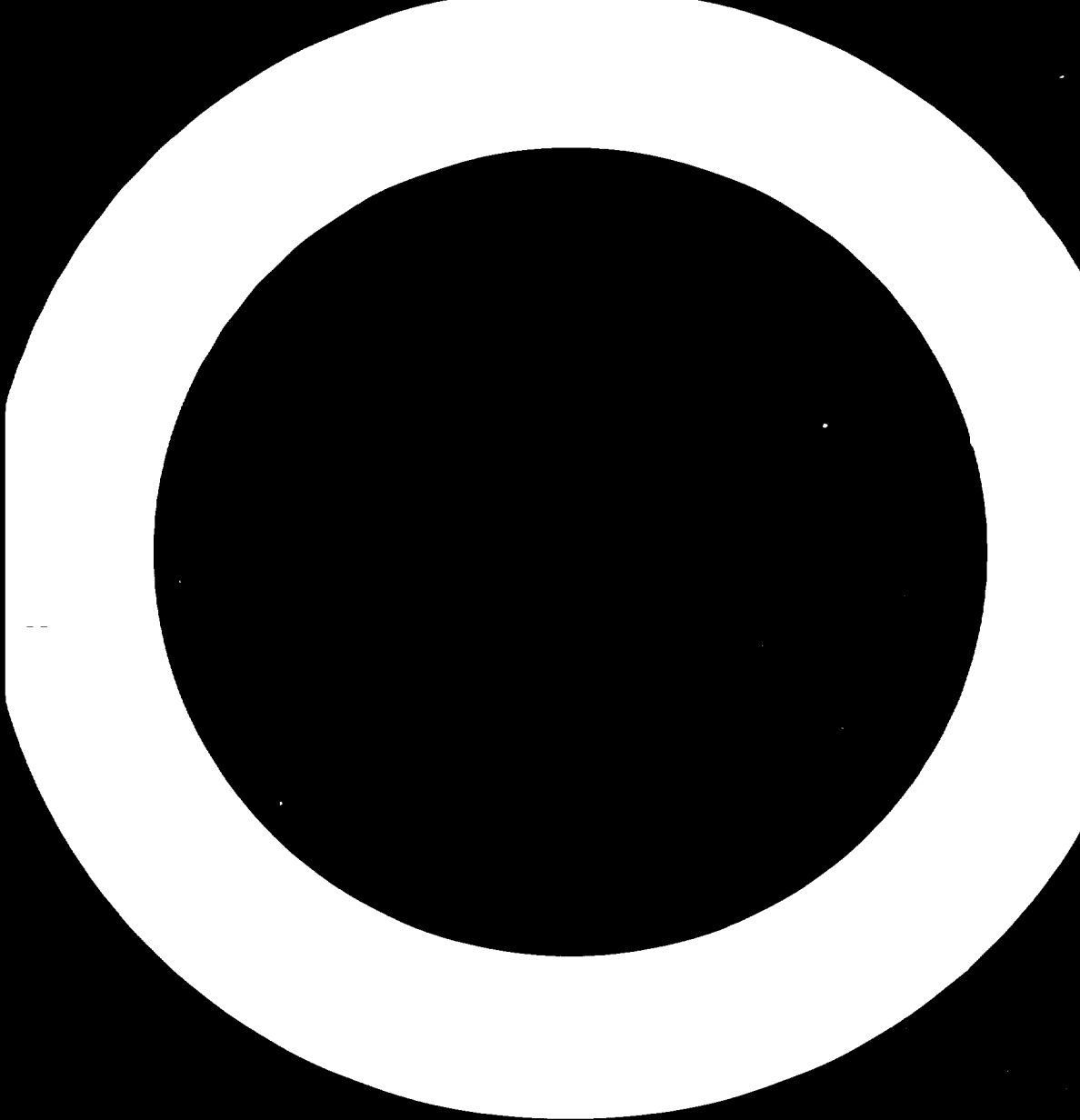
10. ASSISTANCE TO THE INDUSTRY

10.1 It is highly recommended that LANFI continues to assist the industry in a way that it is now, through the analysis of materials, formulation of products, shelf-life evaluation, trouble shooting problems and so far.

10.2 The visits to the industry together with the experts in the field should be implemented. These visits are excellent to detect problems that are normally in the industry event they do not know.

10.3 It is very important to keep a closer contat with supermarkets, distribution centers, where many problems could be detected regarding to the packaging itself and also to the distribution.

10.4 It is recommended to assist the packaging industry more directly in the packaging production line in order to reduce losses and optimze production.



ANNEX I

Tripartite Meeting. - Project DP/MEX/78/011
"Strenghthening of the Mexican Institute for Assistance to Industry"
June 24, 1981

1. PARTICIPANTS

-	Mr. Danilo Jimenez	R.R.	UNDP	Mexico
-	Mr. Fernando Cosio	D.R.R.	UNDP	Mexico
-	Mr. Fernando Fanjsylber	SIDFA	UNIDO	Mexico
-	Mr. Andre Faust	J.P.O.	UNIDO	Mexico
-	Mr. Joao Belo	Back Stoping Officer	UNIDO	Vienna
-	Mr. Luis F. C. Madi	Project Manager	UNIDO	Mexico
-	Mr. Juan A. Careaga	Director General		
-	Mr. Francisco Muñoz	Director Packaging Division	LANFI	Mexico

2. AGENDA

2.1 Visit to the LANFI laboratories and facilities
2.2 Objectives of the meeting
2.3 Summary of the activities
2.4 Participation of LANFI in the Mexican Industry
2.5 General Comments
2.6 Budget Analysis

PROGRAMA DE LAS NACIONES UNIDAS PARA EL DESARROLLO

REVISION DE PROYECTO

PAIS: México

TITULO DEL PROYECTO: Instituto Mexicano de Asistencia a la Industria

NUMERO DEL PROYECTO: DP/MEX/78/011/H/01/37

De acuerdo con las instrucciones para la Revisión Obligatoria de proyectos del PNUD, ejercicio 1981, por la presente se modifica el adjunto calendario del presupuesto del proyecto mencionado supra a fin de reflejar los gastos reales correspondientes al año 1980 y sus consecuencias sobre el presupuesto del año subsiguiente. A fin de reducir al mínimo el aumento en la componente de personal debido a las nuevas estimaciones de costos de expertos y consultores, se dismimuyó de 6 h/m el total de la asistencia de personal internacional. El componente de subcontratos incluye un aumento anteriormente autorizado por el PNUD de México y los restantes componentes se redujeron, en donde fue posible, de acuerdo con estimaciones más precisas de los gastos previstos hasta final de 1981.

La modificación de los insumos del PNUD - Presupuesto del proyecto es como sigue:

Insumos previos del PNUD - Código del presupuesto del proyecto "G"	$ 975,573 (total linea 99)
Insumos revisados del PNUD - Código del presupuesto del proyecto "H" -	$ 977,799 (total linea 99)
Insumos del PNUD - Aumento	$ 2,226

Augusto Arnold

For D. G. A. Butaev, Director

Convenido en nombre de la CNUDI

30 June 1981

Fecha

Aprobado en nombre del PNUD

12.13.81

P ECT . . E P. . . JPL . . . O/F. . . SIO . .

MEXICO	4. NUMERO DEL PROYECTO Y ENMIENDAS DP/MEX/78/011/II/01/37	5. ACTIVIDAD CONCRETA 31.7.E
LO DEL PROYECTO		
INSTITUTO MEXICANO DE ASISTENCIA A LA INDUSTRIA (IMAI)		

PERSONAL PARA PROYECTOS EXPERTOS/Título del puesto	16. TOTAL		17. 1978		18. 1979		19. 1980		20. 1981	
	m/h	dólares EE.UU.	m/h	dólares EE.UU.	m/h	dólares EE.UU.	m/h	dólares EE.UU.	m/h	dólares EE.UU
CTA	16.3	91,175					4.3	22,775	12.0	68,400
Cons. Laboratorios	1.9	8,693				6,330	1.9	2,363		
Experto Capacitacion	7.0	50,400							7.0	50,400
Cons. Merc. Diseño	3.0	21,600							3.0	21,600
Cons. Normalizacion	7.0	46,107					2.0	10,107	5.0	36,000
Cons. Emb. Pap. Carton	4.0	28,800							4.0	28,800
Exp. Env. Emb. Plasticos	12.0	82,686					3.0	17,486	9.0	65,200
Exp. Env. Emb. Metalicos	9.0	50,537					2.5	10,437	6.5	40,100
Cons. Env. Emb. Flexibles	1.5	11,006					1.5	11,006		
Cons. Env. Emb. Frutas	4.6	29,936			.6	2,699	4.0	27,237		
TOTAL PARCIAL:	66.3	420,940			.6	9,029	19.2	101,411	46.5	310,500

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PROYECTO DE PRESUPUESTO/REVISION

2. NUMERO DE CUADE

ERO DEL PROYECTO	16. TOTAL		17. 1978		18. 1979		19. 1980		20. 1981	
	m/h	dólares EE.UU.	m/h	dólares EE.UU.	m/h	dólares EE.UU.	m/h	dólares EE.UU.	m/h	dólares EE.
12.01 Expertos OPAS (Asistencia operacional)										
13.00 Personal de apoyo										
14.00 Voluntarios										
15.00 Viajes de expertos		10,078						4,078		6,00
16.00 Otros gastos de personal		11,397		2,456		4,174		2,167		2,60
17.01 Expertos contratados localmente		24,000						11,000		13,00
17.02 Expertos contratados localmente										
19.00 Total del componente Personal		466,415		2,456		13,203		118,656		332,10
SUBCONTRATACION										
29.00 Total del componente Subcontratación		138,500						68,689		69,81
CAPACITACION										
31.00 Becas		20,540						20,540		
32.00 Giras de estudio, Capacitación colectiva/ Reuniones PNUD		16,344						11,344		5,00
33.00 Capacitación en el servicio										
34.00 Capacitación colectiva (no del PNUD)										
35.00 Reuniones/Consultas (no del PNUD)										
39.00 Total del componente Capacitación		36,884						31,884		5,00
EQUIPO										
49.00 Total del componente Equipo		323,295				200,765		91,530		31,00
VARIOS										
51.00 Operaciones-Mantenimiento		5,000								5,00
52.00 Informes										
53.00 Gastos diversos		7,705				1,100		1,400		5,20
55.00 Atenciones sociales (no del PNUD)										
59.00 Total del componente Varios		12,705				1,100		1,400		10,20
TOTAL GENERAL:		977,799		2,456		215,068		312,159		448,11

PROGRAMA DE LAS NACIONES UNIDAS PARA EL DESARROLLO

REVISION OBLIGATORIA DE PROYECTO 1982

PAIS: MEXICO

TITULO: Instituto Mexicano de Assistencia a la Industria

NUMERO DEL PROYECTO: DP/MEX/78/011/I/01/37

.... Por la presente se modifica el adjunto calendario del presupuesto del proyecto mencionado supra, a fin de reflejar los gastos reales correspondientes al año 1981 y sus consecuencias sobre los presupuestos de años subsiguientes.

De acuerdo con instrucciones específicas del Representante Residente del PNUD durante la última reunión tripartita del proyecto, el 24 de Junio de 1981, el proyecto se considera terminado desde el 31 de Diciembre de 1981. Consecuentemente, de los ahorros en 1981 sólo cantidades mínimas requeridas para compensar obligaciones pendientes han sido transferidas hacia 1982.

La modificación del presupuesto del proyecto - insumos del PNUD - es como sigue:

Insumos previos del PNUD	- Código del presupuesto del proyecto "H"	$ 977,799 (total línea 99)
Insumos revisados del PNUD	- Código del presupuesto del proyecto "I"	$ 945,443 (total línea 99)
Insumos del PNUD - ~~aumento~~ (Reducción)		$ (32,356)

Por D.G.A. Butaev, Director, IO
Convenido en nombre de la ONUDI

1982 -04- 19
Fecha

Aprobado en nombre del PNUD

Fecha

COUNTRY	PROJECT NUMBER AND AMEND	DATE OF ISSUE
MEXICO	DP/MEX/78/011/1	82/04/03

PROJECT PERSONNEL EXPERTS POST/TITLE	1980 M/M	1980 $	1981 M/M	1981 $	1982 M/M	1982 $	1983 M/M	1983 $	SUBSEQ M/M	SUBSEQ $
11-01	4.3	22,775.00	12.0	68,701.00						
11-02	1.9	2,363.00								
11-03			6.7	37,712.00		1,000.00				
11-04			3.0	17,131.00						
11-05	2.0	10,107.00	6.0	44,853.00						
11-06			3.8	35,090.00						
11-07	3.0	17,486.00	7.9	53,514.00		84.00				
11-09	2.5	10,437.00	5.5	29,881.00						
11-11	1.5	11,006.00								
11-12	4.0	27,237.00								
11-XX	19.2	101,411.00	44.9	286,882.00		1,084.00				
15-00		4,070.00		2,891.00						
16-00		2,166.00		2,307.00						
17-01		11,000.00		13,000.00		3,000.00				
1X-XX	19.2	118,655.00	44.9	305,080.00		4,084.00				
29-00		68,689.00		69,741.00						
31-00		20,540.00		5,731.00-		114.00				
32-00		11,344.00		6,099.00						
3X-XX		31,884.00		368.00		114.00				
49-00		91,530.00		26,707.00						
51-00				2,709.00		992.00				
53-00		1,400.00		5,677.00		209.00				
5X-XX		1,400.00		8,466.00		1,201.00				
TOTAL	19.2	312,158.00	44.9	410,362.00		5,399.00				

UNIDO DRAFT MANDATORY REVISION - 1982

COUNTRY	PROJECT NUMBER AND AMEND	DATE OF ISSUE
MEXICO	DP/MEX/78/011/E	82/04/03

PROJECT TITLE

MEXICAN INSTITUTE OF ASSISTANCE TO INDUSTRY

PROJECT PERSONNEL EXPERTS POST/TITLE	TOTAL M/M	TOTAL $	PRIOR M/M	PRIOR $	1977 M/M	1977 $	1978 M/M	1978 $	1979 M/M	1979 $
11-01 CODIRECTOR DEL PROYECT	16.3	91.476.00								
11-02 CONS.LABORATORIES	1.9	8.693.00								6.330.00
11-03 EXPERTO EN CAPACITACIO	6.7	38.712.00								
11-04 CONS.MERC.DISENO INV.Y	3.0	17.131.00								
11-05 CONS.NORMALIZACION	8.0	54.960.00								
11-06 EXP. INV. Y END. PAPEL	3.8	35.090.00								
11-07 EXP.ENV.Y END.DE PLAST	10.9	71.004.00								
11-09 EXP.ENV.Y END.DE METAL	8.0	40.310.00								
11-11 CONS.ENV.Y END.FLEXIBL	1.5	11.006.00								
11-12 CONS.ENV.Y END.FRUTAS	4.6	29.936.00							.6	2.699.00
11-XX	64.7	398.406.00							.6	9.029.00
15-00 EXPERTS TRAVEL		6.969.00								
16-00 OTHER PERSONNEL COSTS		11.103.00						2.456.00		4.174.00
17-01 LOCALLY HIRED EXPERTS		27.000.00								
1X-XX	64.7	443.478.00						2.456.00	.6	13.203.00
29-00 SUBCONTRACTS		138.430.00								
31-00 FELLOWSHIPS		14.923.00								
32-00 STUDY TOURS (UNDP)		17.443.00								
3X-XX		32.366.00								
49-09 EQUIPMENT		319.002.00								200.765.00
51-00 OPERATIONS/MAINTENANCE		3.781.00								
53-00 SUNDRIES		8.386.00								1.100.00
5X-XX		12.167.00								1.100.00
TOTAL	64.7	945.443.00						2.456.00	.6	215.068.00

REMARKS

YEAR END PHYSICAL INVENTORY 1981 OF THE PROJECT DP/MEX/78/011

Country MEXICO Project No. DP/MEX/78/011 Page 1 of 3 NON-EXPENDABLE PROPERTY CONTROL RECORD

Project Title: CONSOLIDACION DEL INSTITUTO MEXICANO DE ASISTENCIA A LA INDUSTRIA Period ending 31/12/81

Hq. Req. Ref.	Item No.	Qty.	Unit	Description	US Dollar Equivalent	P.O.Shipping Advice Ref.	Received Qty.	M	Y	Condition	Qty. on hand	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
79/1	5	1	EA	RELEASE HOOK MODEL QRH-6-M	720.-	15-9-01036	1	4	80	G	1	The model is MCHIRT-G
79/1	4	1	EA	VIBRATION TESTER MODEL 3000-SLVHNR-6	14,335.-	15-9-01062	1	5	80	G	1	
79/1	6	1	EA	TESTING CHAMBER FOR HUMIDITY AND TEMPERATURE	31,250.-	15-9-01152	1	5	80	G	1	
79/1	7	1	EA	HOT AND COLD TESTING CHAMBER	23,250.-	15-9-01152	1	5	80	G	1	
79/1	8	1	EA	TESTING CHAMBER FOR HUMID.AND TEMP	27,500.-	15-9-01152	1	5	80	G	1	
79/1	9	1	EA	AIR CONDITIONED CHAMBER	32,500.-	15-9-01152	1	5	80	G	1	
79/1	1	1	EA	OXTRAW 100 OXYGEN TRANSMISSION RATE. INSTRUMENT WITH TEMPERATURE CONTROL, RECORDER AND ACCESSORIES	14,711.-	15-9-01157	1	6	80	G	1	
79/1	2	1	EA	PERMATRAN W WATER VAPOUR TRANSMISSION RATE INSTRUMENTS WITH SPARES	28,905.-	15-9-01157	1	6	80	G	1	
79/1	3	1	EA	PERMATRAN C-11 CARBON DIOXIDE TRANSMISSION RATE INSTRUMENT WITH SPARES	20,501	15-9-01157	1	6	80	G	1	
74/1	1	1	EA	VEHICLE: FORD LTD WAGON SERIAL NO. 5J4S155165	4,966.-	15-5-00314	1	12	80	B	1	Transferred from DP/MEX/72/014 at no cost.
80/2	1	1	EA	GAS CHROMATOGRAPH-PERKIN ELMER MODEL SIGMA 3	13,000.-	15-0-00585	1	12	80	G	1	
80/2	2	1	EA	GAS CHROMATOGRAPH-PERKIN ELMER MODEL SIGMA 1-13	28,200.-	15-0-00486	1	10	80	B	1	Supplier gave other equipment while will fix original one.
80/2	5	5	EA	S-67433-80 VISCOSIMETER	275.-	15-0-01026	1	3	81	G	1	
	7	1	EA	S-67424 VISCOSIMETER BATH	1,060.-	- " -	1	3	81	G	1	
80/2	8.1	1	EA	VACUUM SEAMER, NEW MB 1A	9,009.-	15-0-01048	1	4	81	G	1	
	8.4	1	EA	VACUUM PUMP LACY HULBER X.B.2.COMP	3,874.-	- " -	1	4	81	G	1	
80/2	9	1	EA	TEMPERATURE CABINET UP TO 600°F	15,130.-	15-0-01098	1	5	81	G	1	
	10	1	EA	COLD ROOM WITH CO_2 LIQUID	2,485.-	- " -	1	5	81	G	1	
	11	1	EA	COMPRESSION MODULE	1,090.-	- " -	1	5	81	G	1	

UNITED NATIONS NATIONS UNIES

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

Country : MEXICO Project No. DP/MEX/78/011 Page 2 of

Project Title : CONSOLIDACION DEL INSTITUTO MEXICANO DE ASISTENCIA A LA INDUSTRIA Period ending

NON – EXPENDABLE PROPERTY CONTROL RECORD

PO Req. Ref.	Item No.	Qty.	Unit	Description	US Dollar Equivalent	P.O./Shipping Advice Ref.	Received Qty.	Received M	Received Y	Condition	Qty. on hand	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
80/2	12	1	EA	HYDRAULIC JACK	1,755.-	15-0-01098	1	5	81	G	1	
	13	1	EA	BASIC COMPRESSION SET	545.-	- " -	1	5	81	G	1	
80/2	2	1	EA	RELATEST - CLIMATIC TESTING CHAMBER TYPE KSE	6,008.-	15-1-00209	1	-	-	G	1	Arrived March 82
	2.1	1	EA	TRANSFORMER	293.-	- " -	1	-	-	G	1	Arrived March 82
80/2	1	1	EA	MELT INDEXER NO. 204	4,300.-	15-1-00243	1	7	81	G	1	
	3	1	EA	FALLING BALL IMPACT TESTER NO. 270	3,700.-	- " -	1	7	81	G	1	
	4	1	EA	MOISTURE PERVIOUS OVEN NO.559 WITH ACCESS.	10,000.-	- " -	1	7	81	G	1	Model 558

UNITED NATIONS NATIONS U

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANI

NON – EXPENDABLE PROPERTY CONTROL REC

Country MEXICO Project No. DP/MEX/78/011 Page 3 of 3

Project Title SEE PAGE ONE Period ending 31 DECEMBER 1981

...nO ...eq. ...ef.	Item No.	Qty.	Unit	Description	US Dollar Equivalent	P.O./Shipping Advice Ref.	Received Qty.	Received M	Received Y	Condition	Qty. on hand	Remark
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)

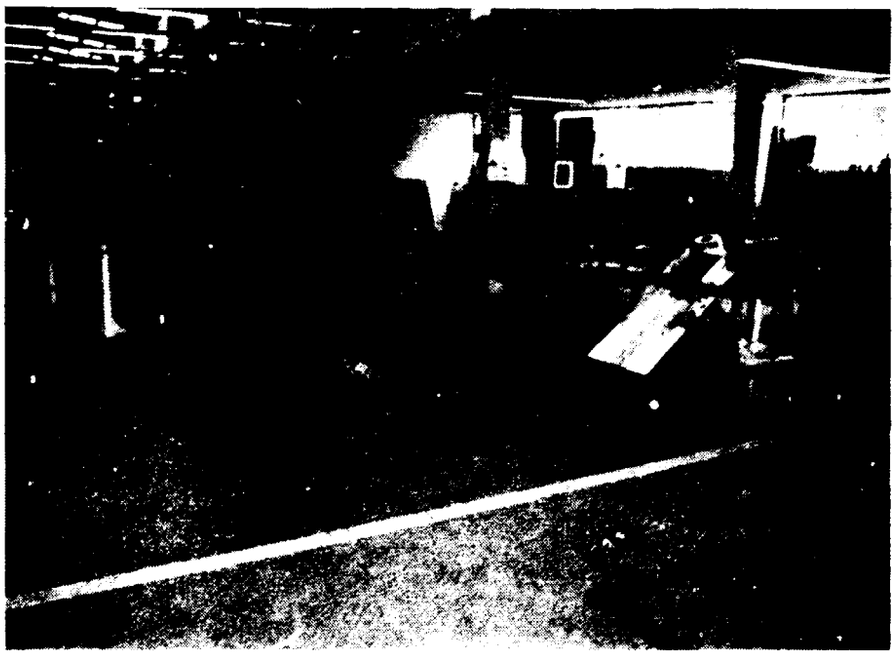
WE CERTIFY THAT THE QUANTITIES OF NON-EXPENDABLE EQUIPMENT RECEIVED LESS THE QUANTITIES OF NON-EXPENDABLE EQUIPMENT WRITTEN-OFF REFLECT THE PHYSICAL COUNT OF THE ITEMS ON HAND AS AT 31 DECEMBER 1981.

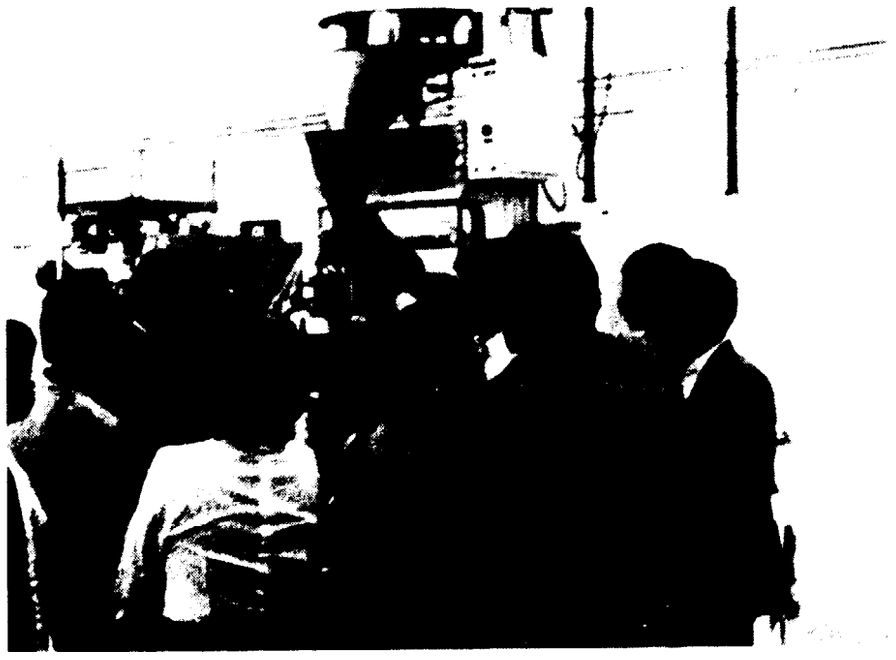
PROJECT MANAGER UNIDO or RESIDENT REPRESENTATIVE X LUIS FERNANDO CERIBELLI MADI ..... Date 03/25/82

JUAN ANTONIO CAREAGA

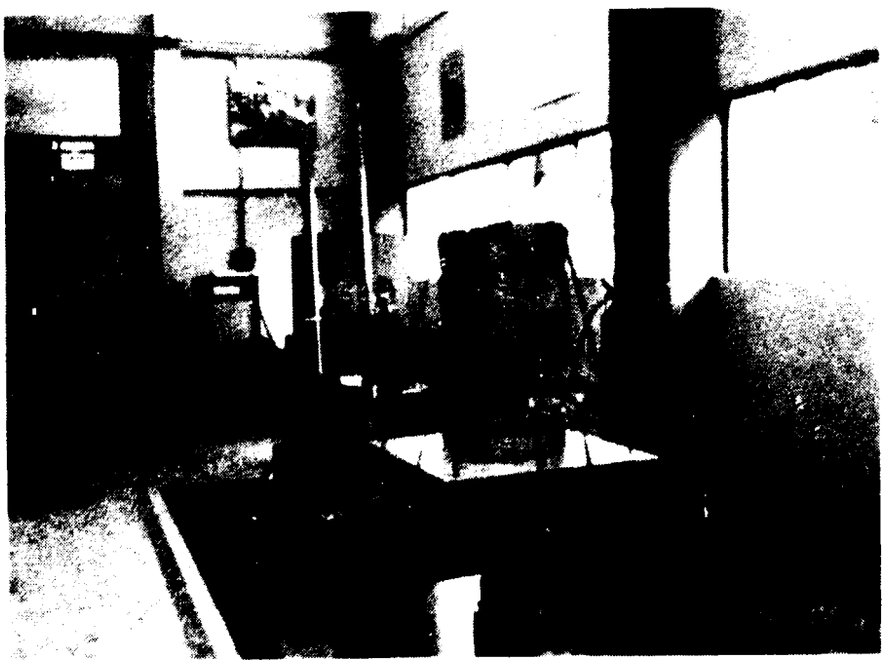
GOVERNMENT COUNTERPART ..... Date 03/25/82

1. PACKAGING PILOT PLANT



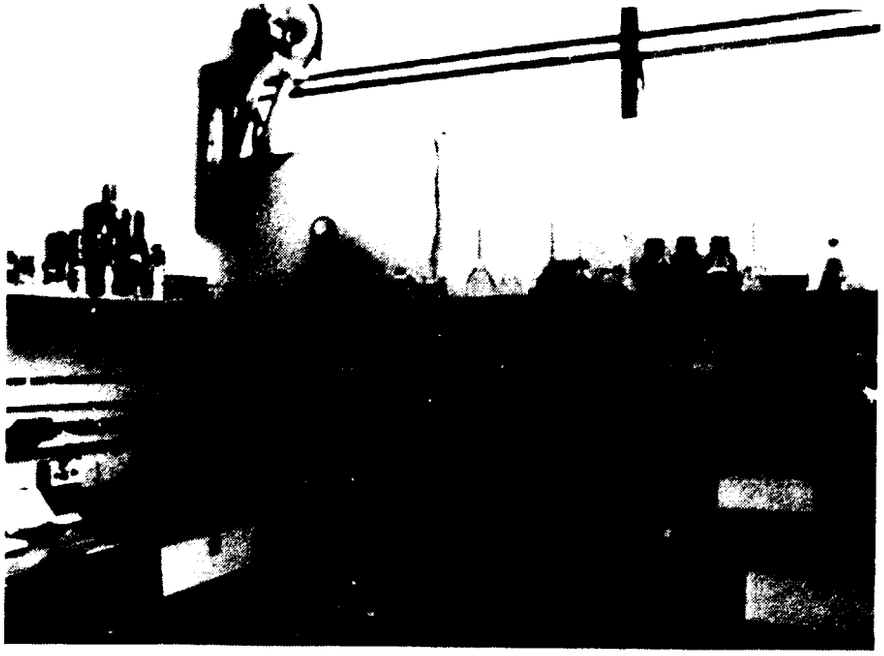


2. TRANSPORT LABORATORY

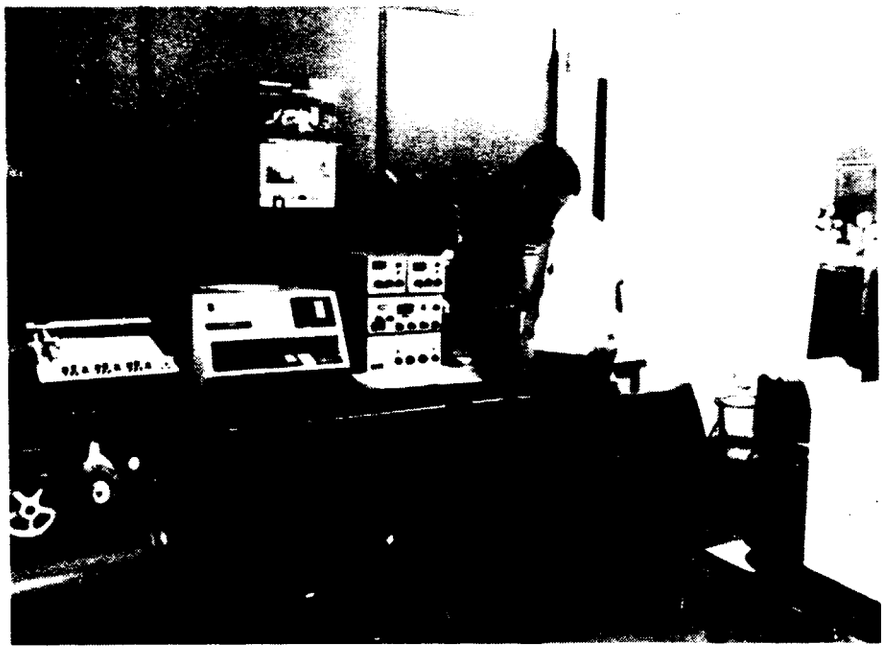


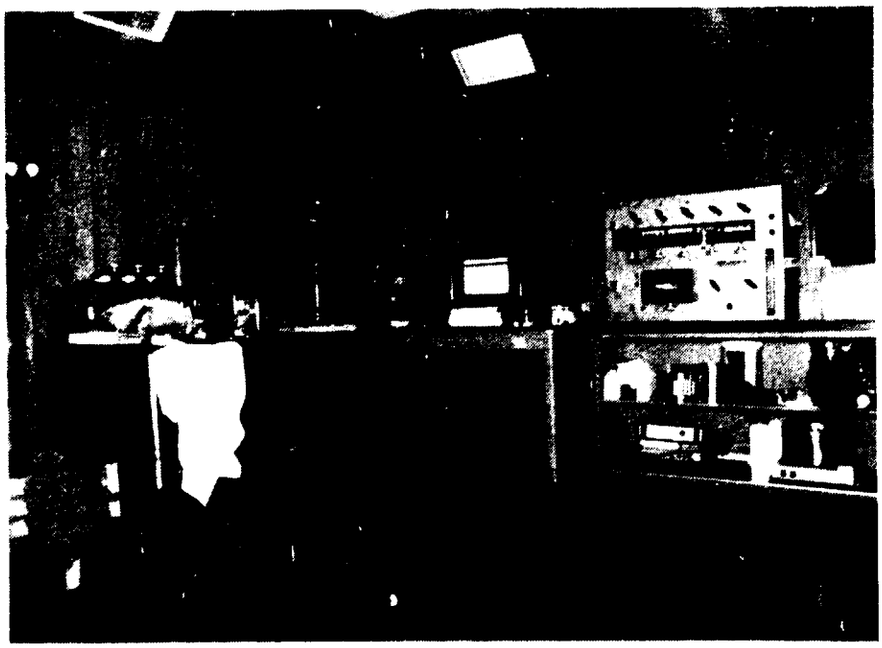
3. FOOD PROCESSING PILOT PLANT

4. METAL PACKAGING LABORATORY

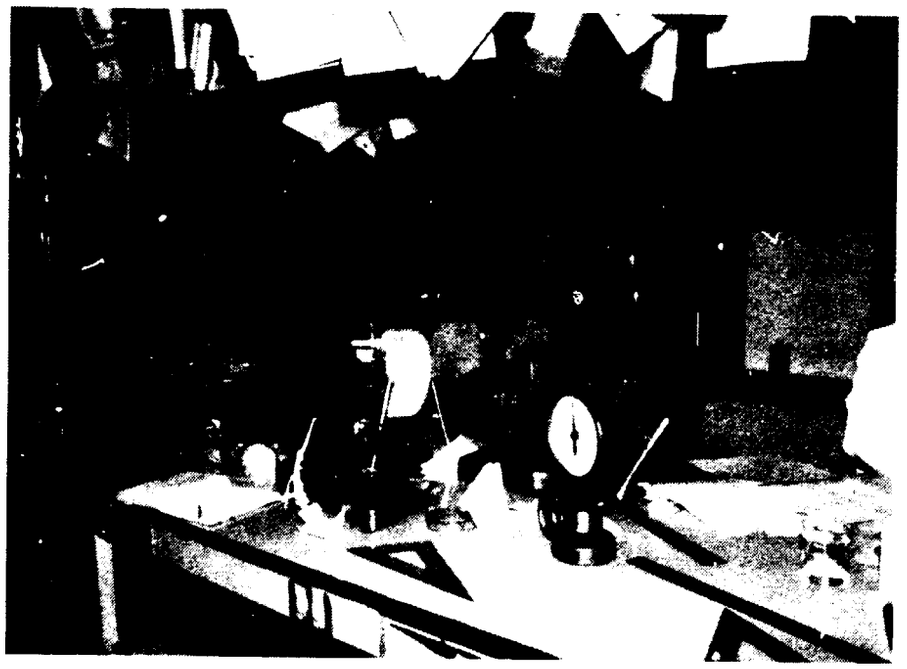


5. PLASTIC LABORATORY





6. PAPER AND CORRUGATED BOARD LABORATORY

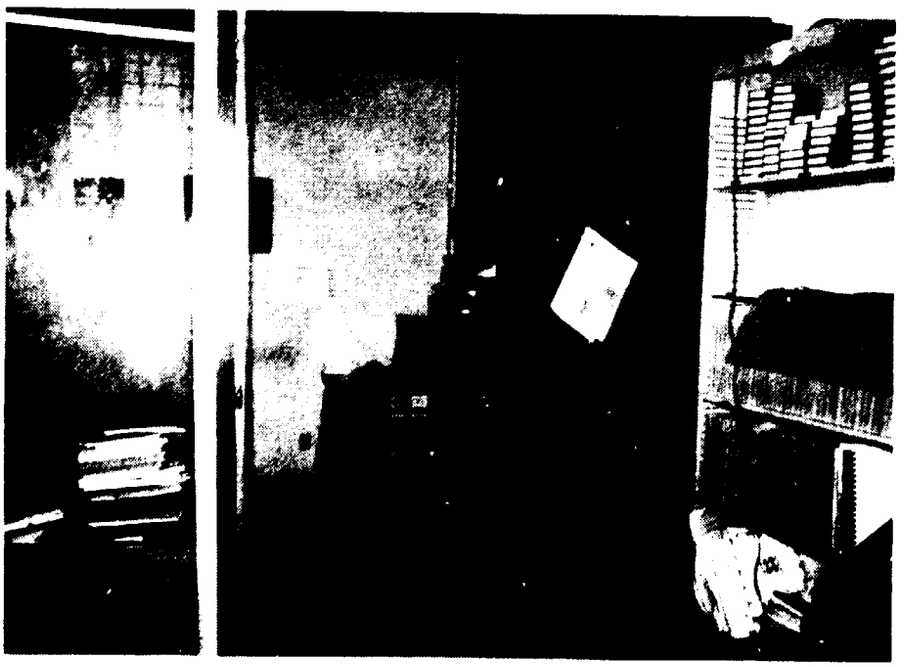


7. PACKAGING DESIGN DEPARTMENT

8. SHELF LIFE LABORATORY

9. STANDARDIZATION DEPARTMENT

10. MARKET ECONOMICS AND INFORMATION CENTER



ANNEX IV

LIST OF COMPANIES PARTICIPATING IN THE UNIDO-LANFI COURSES AND SEMINARS

1. SEMINARIO DE ENVASES PARA ALIMENTOS

Note: The list of the participants is not available at LANFI.

2. SEMINARIO DE ENVASES DE HOJALATA PARA LA INDUSTRIA DE ALIMENTOS

1. Pescatun, S.A.
2. Infrucasa de Aguascalientes
3. Industrias Seitment
4. Herdez
5. Mobil Atlas, S.A.
6. Benef. de Coco
7. Productos Darex, S.A.
8. Alimentos del Fuerte
9. Crown cork de México
10. Botemex, S.A.
11. Envases Cilíndricos
12. Inmont de México
13. General Foods
14. Richardson Merrel
15. Ind. Aries
16. 3 M de México
17. Clemente Jacques
18. Departamento de Pesca
19. Envases Generales Continental
20. Mobil Atlas
21. Productos Pesqueros Mexicanos
22. General Point Co.
23. Alcan Aluminio
24. Bayer, S.A.
25. Jugos del Valle
26. La Costeña
27. Tecnológico de La Paz
28. Multipak
29. Productos Aurolin
30. Universidad Autóroma de Querétaro
31. Mexicana de Envases
32. Ind. Metal del Envase
33. Laboratorios Nacionales de Fomento Industrial - LANFI

3. SEMINARIO DISEÑO DE ENVASES Y EMBALAJES PARA PRODUCTOS ALIMENTICIOS INDUSTRIALES

1. Asociación Mexicana de Institutciones de Seguros
2. Banpesca
3. Celloprint, S.A.
4. Cervecería Moctezuma, S.A.
5. Compañía de Pinturas General Paint Glidden
6. Compañía Nestlè, S.A.
7. Chiclets Adams
8. Digitek, S.A. de C.V.
9. Empaques de Cartón Titán
10. Envases Plásticos RAL, S.A. de C.V.
11. Fide, S.A.
12. La Interamericana
13. Pan de Pulque de México, S.A.
14. Seguros América Banamex
15. U.N.P.A.S.A.
16. Laboratorios Nacionales de Fomento Industrial - LANFI

4. SEMINARIO PRINCIPALES ASPECTOS ECONOMICOS RELACIONADOS CON LA INDUSTRIA DE ENVASE Y EMBALAJE

1. Envases Astrolito, S.A.
2. Servicios de Control de Riesgo, S.A.
3. Empaques de Cartón United
4. ENEP - Zaragoza
5. Universidad Latino Americana
6. Sanchez, S.A.
7. Vidriería Los Reyes, S.A.
8. General Foods, S.A.
9. Compañía Nestlè, S.A.
10. Nueva Modelo, S.A.
11. Industria H-24
12. Richardson Merrel, S.A.
13. Conservas San Miguel, S.A.
14. Elias Pando, S.A.
15. Envases Astrolito
16. Policel de México, S.A.
17. Laboratorios Nacionales de Fomento Industrial - LANFI

5. SEMINARIO CONTROL DE CALIDAD PARA FABRICANTES Y USUARIOS DE ENVASES DE CARTON PLEGABLE Y CORRUGADO

1. General Foods de México, S.A.
2. Anderson Clayton, Co
3. Industrias Fotográficas, S.A.
4. Papeles Ponderosa, S.A.
5. Asociación nacional de Fabricantes de Cajas de Cartón Corrugado, A.C.
6. Corrugados Tehuacán, S.A.
7. Industrias Fotográficas Interamericanas, S.A.
8. Avon Cosmeticos, S.A. de C.V.
9. Marcas Alimenticias Nacionales, S.A. de C.V.
10. Cervecería Moctezuma, S.A.
11. 3 M de México, S.A.
12. Jugos del Valle, S.A.
13. Dirección General de Normas
14. Empaques de Cartón United
15. Polycel de México
16. Laboratorios Nacionales de Fomento Industrial - LANFI

6. SEMINARIO USO DE ENVASES FLEXIBLES EN LA INDUSTRIA DE ALIMENTOS

1. Grapho Regia
2. Div. Corp. Impulsora
3. Empacadora Búfalo, S.A.
4. General Foods de México
5. Plastoza
6. Productos de Leche
7. Celloprint
8. Polycel
9. Consorcio Papelero
10. Sin. Carbon, S.A.
11. Campbell's de México
12. Cámara Nacional de la Industria de la Transformación
13. Laboratorios Nacionales de Fomento Industrial - LANFI

7. CURSO CONTROL DE CALIDAD DE ENVASES METALICOS PARA PRODUCTOS ALIMENTICIOS - CURSO TEORICO-PRACTICO

1. Cafés de Veracruz
2. Empacadora del Noroeste
3. Envases Generales Continental de México, S.A.
4. Productos Aurolín, S.A.
5. Instituto Tecnológico de Sonora
6. Mobil Atlas, S.A. de C.V.
7. General Point Co. de México, S.A.
8. Productos Pesqueros Mexicanos
9. Jugos del Valle
10. Campbell's de México, S.A.
11. Fábricas Monterrey, S.A.
12. Conservas del Pacífico
13. Productos Pesqueros de Mazatlán
14. Crown Cork de México, S.A.
15. Herdez, S.A.
16. Richardson Vicks, S.A. de
17. U.N.P.A.S.A.
18. U.N.A.M.
19. Facultad de Estudios Superiores Cuautitlán
20. Bayemsa
21. Laboratorios Nacionales de Fomento Industrial - LANFI

8. SEMINARIO "LA IMPORTANCIA DEL DISEÑO GRAFICO EN LA COMERCIALIZACION DE PRODUCTOS ENVASADOS"

1. Vitro Envases Plásticos
2. Campbell's de México, S.A.
3. CONCAMIN
4. Consorcio Papelero Mexicano, S.A.
5. Coletio de Bachilleres
6. Instituto Mexicano de Comercio Exterior
7. Universidad Nacional Autónoma de México
8. Cartón y Papel de México, S.A.
9. Alimentos del Fuerte, S.A.
10. Centro de Capacitación Litográfica, A.C.
11. Dirección General de Industrias (SEPAFIN)
12. ENEP - Zaragoza, UNAM
13. Universidad Iberoamericana
14. Alazraki y Rodríguez, Publicidad
15. Universidad Autónoma Metropolitana
16. Laboratorios Nacionales de Fomento Industrial - LANFI

9. SEMINARIO "PAPELES PARA ENVOLTURAS. BOLSAS Y SACOS. LA IMPORTANCIA DE LA CALIDAD DEL PAPEL Y SU COMPORTAMIENTO COMO ENVASE"

1. Consorcio Papelero Mexicano
2. Compañía Industrial de Atentique, S.A.
3. Compañía Papelera Maldonado, S.A.
4. Bolsas Maldonado, S.A.
5. A.P.S.A.
6. Fábricas de Papel San Rafael y Anexos, S.A.
7. Laboratorios Nacionales de Fomento Industrial - LANFI

10. SEMINARIO SOBRE PROCESOS DE ENVASADO Y EMBALADO

1. Grafo Regia, S.A.

2. Productos Aurolín, S.A.

3. Cyanamid de México, S.A.

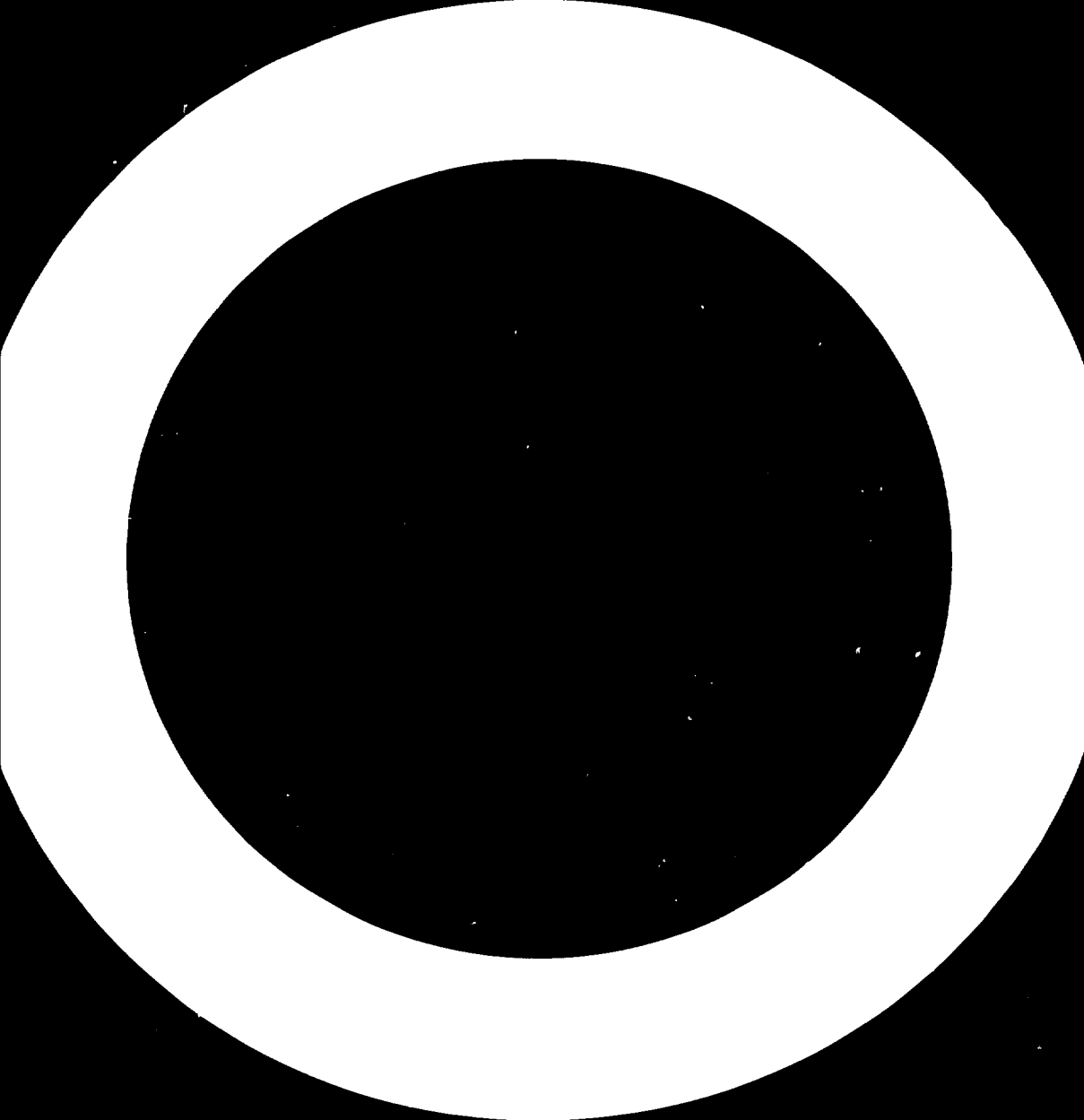
4. Laboratorios Nacionales de Fomento Industrial - LANFI

ANNEX V

PRONOSTICO A CORTO Y MEDIANO PLAZO DEL CONSUMO DE ENVASES Y EMBALAJES EN LA REPUBLICA MEXICANA

Reporte final preparado por el Dr. William Manning, Cristopher Cross (PIRA) y la Ing. Leticia Quevedo P., Depto. de Información y Proyectos (LANFI), para la Organización de las Naciones Unidas para el Desarrollo Industrial (ONUDI), Oficina Ejecutiva del Programa Nacional de Desarrollo.

contenido



SUMMARY MICHIGAN STATE UNIVERSITY REPORT

ANNEX VI

LIST OF LANFI PARTICIPANTS

CONSOLIDATION OF THE MEXICAN INSTITUTE
FOR ASSISTANCE TO INDUSTRY

DP/MEX/78/011
MEXICO

Draft Final Report: Qualitative and Quantitative Improvement of the Training Courses on Packaging Material Production and Food Packaging Technologies

Based on the work of:

Theron Downes, expert in food packaging
Jack Giacin, expert in packaging analysis
Bruce Harte, expert in food packaging
Hugh Lockhart, expert in package testing
Chester Mackson, expert in packaging administration

Language: English

SUMMARY

This report describes the work performed by the School of Packaging at Michigan State University under UNIDO Contract #80/157. The report consists of this document and six separate volumes describing the work with special emphasis on the preparation and presentation of two courses on site in Mexico City. The two courses were:

1. Food Packaging
2. Analytical Aspects of Packaging

In addition to the material above this report also describes compliance with the contract request for proposals for continuing cooperation.

It is concluded that the utilization of a team approach with several team members working on site for short periods of time coupled with significant work at the contractors location provides an effective and efficient adjunct to long term consultants. It is recommended that cooperative links should be established between IMAI and Michigan State University as described elsewhere in this report.

CONTENTS

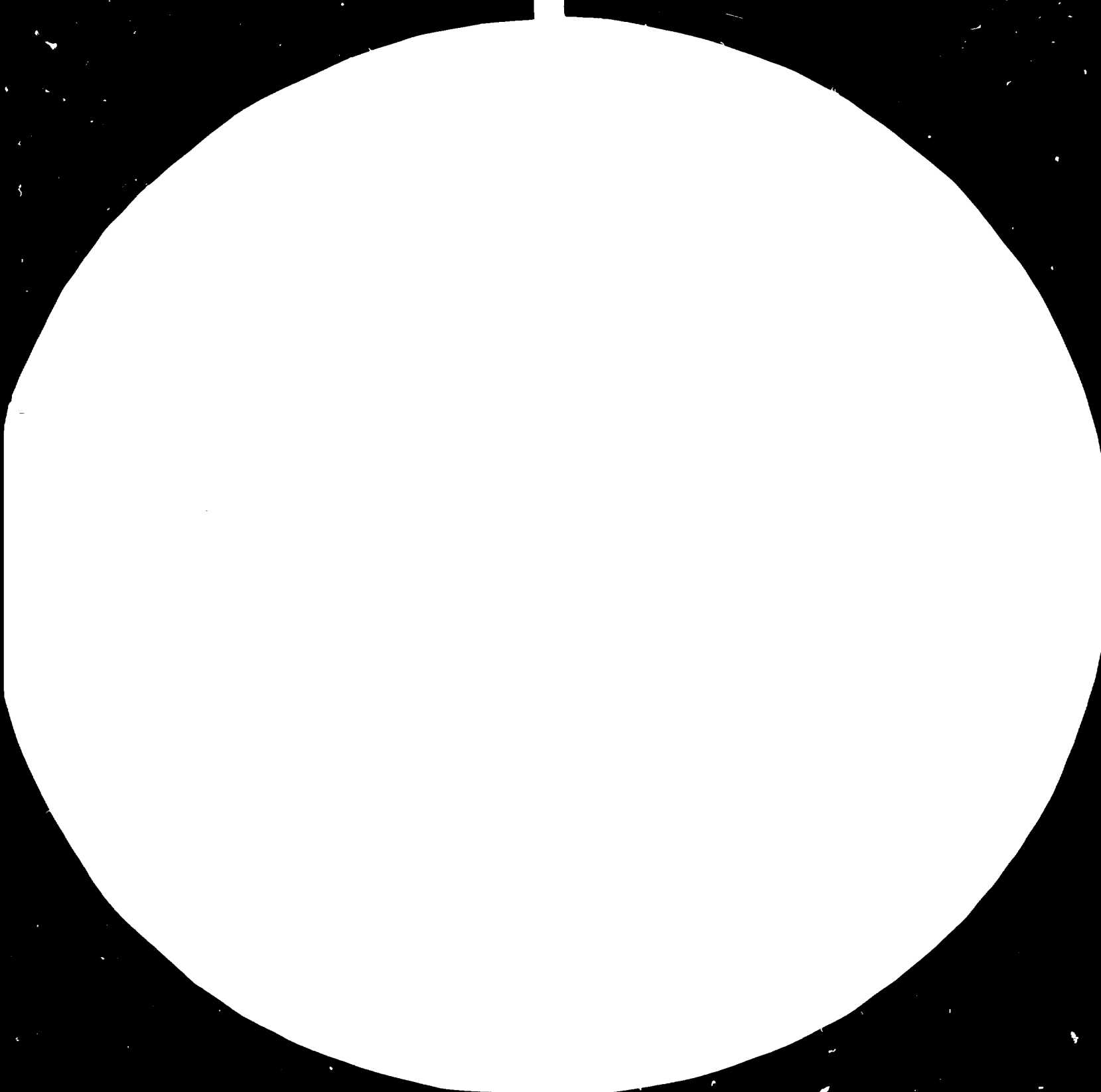
INTRODUCTION

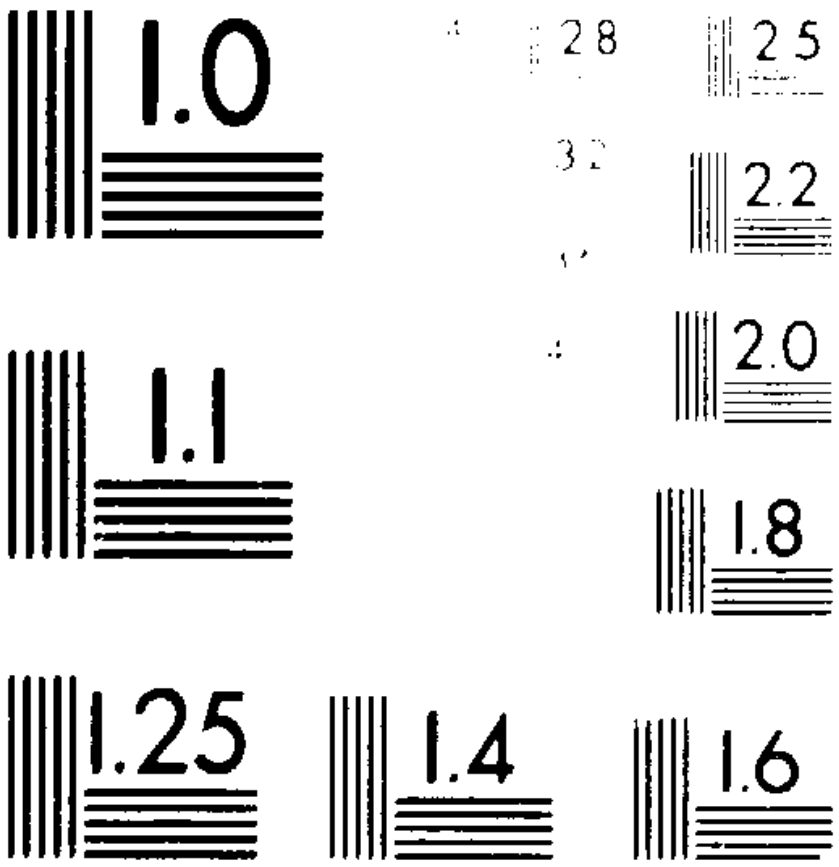
This report describes the work performed under UNIDO Contract #80/157 Qualitative and Quantitative Improvement of the Training Courses on Packaging Material Production and Food Packaging Technologies. The nature of the work performed is consistant with historical approaches to these efforts. The manner of implementation represents a departure from conventional methods. A total of 2.75 man months of time was spent working on site in Mexico City. This total, however, is the sum of the work performed by a team of five individual members of the faculty of the School of Packaging at Michigan State University. The work performed is described in the body of this report in roughly chronological order. The work performed is outlined below:

1. Initial visit to Mexico City for appraisal of national conditions for implementation
2. Preparation of tentative course outlines
3. Determination and collection of assigned reading materials
4. Course material preparation
5. Presentation of the course, Food Packaging (Mexico City)
6. Presentation of the course, Analytical Aspects of Packaging (Mexico City)
7. Special projects consisting of individual laboratory assistance and advice on specific research projects
8. Preparation of proposals for continuing cooperation
9. Meetings related to proposals for continuing cooperation (Mexico City)

The team approach to execution of duties of this nature is somewhat novel. Oral and written evaluations of the work indicate that it was well received and effective. The team approach would not be well suited to work which requires individuals to be on site for extended periods. The duties requested for this project included training and course development and appear to have been ideally suited to a team approach. It is suggested that the team approach be strongly considered in the future as an adjunct to long term consultants.

Individual staff members at LANFI have solid technical backgrounds, in general. Their experience in packaging is somewhat limited. Exposure to the breadth of background experience and training represented by a faculty of packaging is extremely beneficial to their professional growth. Continued exposure through additional follow-up courses on site, visits to MSU and, work toward graduate degrees is recommended.





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS
STANDARD REFERENCE MATERIAL 1010a
ANSI/ISO TEST CHART No. 2

APPRAISAL OF NATIONAL CONDITIONS

The initial visit to the LANFI Laboratories in Mexico City was made by Theron W. Downes and Hugh E. Lockhart during the period May 10, 1981 to May 17, 1981. The primary purpose of this visit was to get acquainted with the resources of IMAI for training purposes with particular regard to the available personnel, equipment and technical support. During this period personal interviews were conducted with most of the individuals from LANFI who were planning to be attending the courses to be offered in the Fall. Tentative course outlines were prepared for approval at that time. The courses as offered in the Fall did not differ significantly from the agreements and understandings which were reached in May. The guidance, assistance, and cooperation of Senors Francisco Munoz and Luis Madi in this phase of the project are gratefully acknowledged.

COURSE 1 - FOOD PACKAGING

The tentative outline for the course on Food Packaging as prepared in May, 1981 in Mexico City is presented below.

FOOD PACKAGING

Instructors: Dr. Theron W. Downes
Dr. Bruce R. Harte

A. INTRODUCTION

1. Product Problems Affected by Package (Lipid oxidation, non-enzymatic browning, freezer burn, etc.)

2. Environmental Influences

B. PACKAGING REQUIREMENTS BY PRODUCT TYPE

1. General Principles

2. Specific Products:

-fish
-meat
-eggs
-milk and milk products
-juice
-baked goods (eg. tortilla)
-oils and lipid containing foods
-fresh and processed fruits and vegetables (tomato, chili, etc.)

C. COMPATABILITY

1. Flavor - permeation, adsorption, absorption, migration

2. Environmental Stress Cracking, Properties Alteration

D. SHELF-LIFE (except cans)

1. Moisture Content

a. isotherms by product type
b. A_w and reaction rates
c. Shelf-life estimation

1. low moisture
2. intermediate moisture

2. Oxidation

3. Respiration (trucks, packages)

E. SHELF STABLE ("commercially" sterile) FOODS

1. In Package Thermal Processing

a. cans
b. glass
c. retort pouch
d. rigid plastic

2. Alternate Techniques.

a. Aseptic

1. cans - steam, hot air
2. form-fill-seal
   - ethylene oxide
   - H_2O_2
   - radiation
   - acid

b. In Package

1. radiation
2. ethylene oxide

F. INTRODUCTION TO HEAT PROCESSING

1. Heat Penetration

a. Principles
b. Measurement
c. Kinetics

1. chemical reaction
2. microbial death

d. Analysis

$T_1 - T = j(T_1 - T_0)10^{-t/f}$
CUT
g, z, F_o, F_T^Z

COURSE II - ANALYTICAL ASPECTS OF PACKAGING

The course outline for the course on Analytical Aspects of Packaging as prepared in June 1981 is presented below. The course was presented in Mexico City November 2, 1981 through November 31, 1981 and was essentially unchanged.

ANALYTICAL ASPECTS OF PACKAGING

Instructors: Dr. Jack Giacin
Dr. Hugh Lockhart

The areas to be discussed are presented in the following topical outline:

A. Spectrophotometric Methods of Analysis

1. Quantitative analysis by spectrophotometric methods

2. Application of ultraviolet, visible and infrared spectroscopy to packaging problems

3. Atomic absorption spectroscopy

B. Chromatographic Methods of Analysis

1. Theoretical considerations and basic principles of chromatography

   a. High pressure liquid chromatography (HPLC)
   b. Gel permeation chromatography (GPC)
   c. Gas chromatography (GC)
   d. Gas chromatography/mass spectroscopy (GC/MS)

2. Application of chromatographic techniques to packaging problems

   a. Qualitative analysis
   b. Quantative analysis

C. Mass Transport Considerations (Migration and Permeation)

1. Transport considerations of potential migrants into and from barrier packaging materials

   a. Methods of monitoring migration
   b. Selected examples of potential migrants in packaging materials, their analysis and transfer to a product contact phase

2. Mass transport considerations of barrier packaging materials

a. Methods of measuring permeability and derivation of permeability constant and diffusion coefficient
b. Selected examples of determining permeability and diffusion coefficients of packaging materials and the relationship to product shelf life

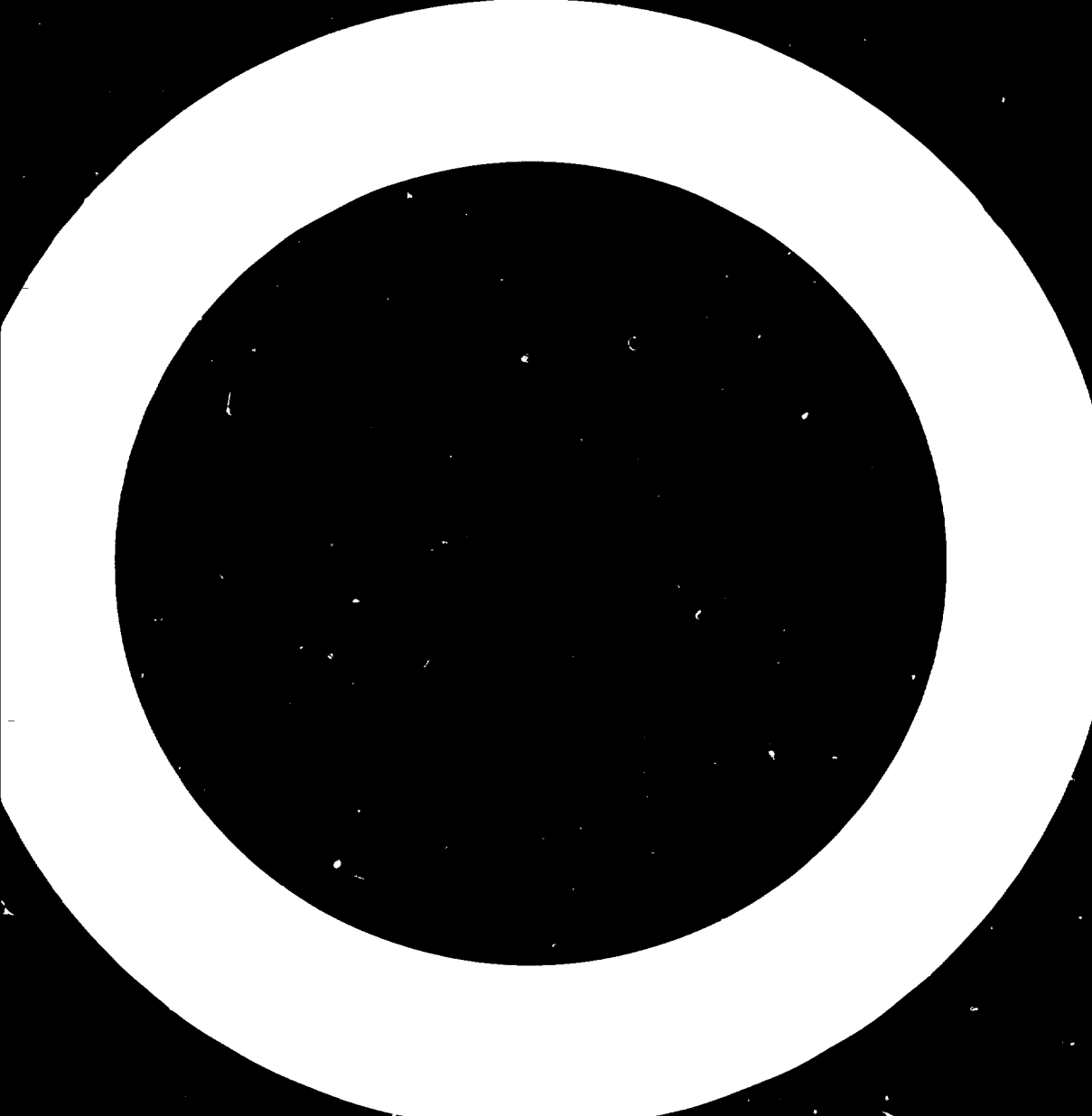
D. Thermal Methods of Analysis for Characterization of Packaging Materials

1. Differential scanning calorimetry

2. Thermal gravimetric analysis

LIST OF PERSONS WHO ATTENDED THE PACKAGING COURSE M.S.U

1. Lourdes Osnaya Suárez
2. Brisia Rodriguez García
3. Maribel Rodríguez Montova
4. Natividad Venegas Herrera
5. Luz Ma. Villar López
6. Alejandro Estúa Cárdenas
7. Laura Paredes Lorea
8. Martha Emma Jiménez
9. Ligia Ruiz
10. Aida Hernández Hernández
11. Ma. Rosa Huerta de Landeros
12. Angélica Armenta
13. Ana Luisa Rentería
14. Elsa Austria
15. Cecilia Rojas de Gante



OFFICIAL STANDARD IN THE PACKAGING AREA IN MEXICO

ANNEX VII

NORMAS OFICIALES MEXICANAS

NOM-EE-1-1970 "Valijas de lona empleada en el transporte de correspondencia por Vías de superficie".

NOM-EE-2-1952 "Valijas empleadas en el transporte de correspondencia aérea".

NOM-EE-3-1954 "Hilos de Henequén para empacar (Baler-Twine).

NOM-EE-3-1980 "Envase y Embalaje.- Textiles.- Hilos de henequén para embalar".

NOM-EE-4-1980 "Envase.- Textiles.- Sacos o costales de henequén.- Especificaciones

NOM-EE-4-1954 "Sacos o costales hechos con fibras de henequén".

NOM-EE-5-1943 "Abrigos de fibra de palma para pacas de algodón".

NOM-EE-5-1981 "Embalaje.- Textiles.- Abrigos de Fibra de Palma para Pacas de Algodón.- Especificaciones".

NOM-EE-6-1954 "Tela empleada en la fabricación de bolsas o sacos usadas para la recolección del algodón en rama".

NOM-EE-7-1965 "Sacos de tela de lagodón par envasar harina de trigo".

NOM-EE-7-1981 "Envase.- Textiles.- Sacos de algodón para envasar harina de trigo. Especificaciones".

NOM-EE-8-1065 "Sacos de tela de algodón sin blanquear para envasar azúcar"..

NOM-EE-9-1961 "Lámina negra, hojalata y lámina emplomada en la fabricación de envases".

NOM-EE-10-1949 "Nomenclatura para la definición de términos empleados en relación a la industria de envases de hojalata".

NOM-EE-10-S-1980 "Envase y Embalaje.- Envases metálicos para alimentos.- Terminología".

NOM-EE-11-1949 "Envases sanitarios de hojalata para alimentos".

NOM-EE-11-S-1980 "Envase y Embalaje.- Metales.- Envases cilíndricos de hojalata para contener alimentos.- Especificaciones".

NOM-EE-12-1980	"Envases de vidrio para productos medicinales de uso oral o tópico," (esta Norma cancela la NOM-EE-12-1974).
NOM-EE-12-1974	"Envases de vidrio para productos medicinales de uso oral o tópico".
NOM-EE-13-1975	"Ampolletas y frascos, ampula de vidrio para uso medicinal, elaborados con tubo de vidrio borosilicato".
NOM-EE-14-1973	"Cajas de plástico para el manejo, transporte y almacenamiento de botellas".
NOM-EE-15-1951	"Huacales de madera para transportar fruta".
NOM-EE-16-1952	"Cajas de madera para empaque".
NOM-EE-17-1964	"Barricas de madera para el transporte de óxido arsenoso procedente de fundiciones minerales"
NOM-EE-18-1964	"Método de prueba para la determinación de la clase de las barricas de madera para el transporte de óxido arsenioso".
NOM-EE-19-1964	"Método de prueba para determinar las dimensiones de las barricas de madera para el transporte de óxido arsenioso".
NOM-EE-20-1951	"Barriles pulqueros".
NOM-EE-21-1974	"Envases para aceites esenciales".
NOM-EE-22-1957	"Película de celulosa regenerada, generalmente conocida como "celofán" empleada en la industria cigarrera".
NOM-EE-23-1957	"Película de celulosa regenerada, generalmente conocida como "celofán"empleada en la envoltura en general".
NOM-EE-24-1976	"Envases de vidrio para leche y crema".
NOM-EE-25-1976	"Envases de vidrio para aguas envasadas con o sin gas".
NOM-EE-26-1968	"Envases de vidrio para aceites comestibles".
NOM-EE-27-1968	"Envases de vidrio para cerveza".
NOM-EE-27-1980	"Envase de vidrio para cerveza".
NOM-EE-28-1957	"Botellas termo".

NOM-EE-29-1974	"Envases de vidrio para productos de perfumería".
NOM-EE-29-1979	"Envases de vidrio para productos de perfumería y cosmética", (esta Norma cancela la NOM-EE-29-1974).
NOM-EE-30-1977	"Envases de vidrio para alimentos en general".
NOM-EE-31-1977	"Envases de vidrio para alimentos infantiles".
NOM-EE-32-1977	"Envases de vidrio para bebidas alcohólicas en general".
NOM-EE-33-1978	"Envases de vidrio moldeado para productos medicinales".
NOM-EE-34-1978	"Envases de vidrio para productos industriales en general".
NOM-EE-35-1978	"Bote lechero de acero estañado".
NOM-EE-36-1972	"Bolsas estilo sobre para envasar queso fundido".
NOM-EE-37-1973	"Determinación de la resistencia a la absorción de agua en empaques y embalajes de cartón".
NOM-EE-38-1973	"Método de prueba para los adhesivos empleados en cerrar y sellar empaques y embalajes de cartón".
NOM-EE-38-1981	"Envase y Embalaje.- Cartón y Papel.- Método de prueba para adhesivos".
NOM-EE-39-1973	"Determinación de la resistencia a la compresión vertical para empaques y embalajes de cartón".
NOM-EE-39-1979	"Envase y Embalaje.- Determinación de la resistencia a la compresión".
NOM-EE-40-1973	"Determinación de la resistencia a la flexión estática del fondo para empaques y embalajes de cartón".
NOM-EE-41-1973	"Método de prueba en la mesa oscilante y vibrante para empaques y embalajes de cartón".
NOM-EE-41-1979	"Envase y Embalaje.- Determinación de la resistencia a la compresión".
NOM-EE-42-1973	"Método de prueba de aplastamiento para cartón corrugado".

NOM-EE-43-1973	"Determinación del sentido longitudinal de papel para envases y embalajes".
NOM-EE-44-1974	"Determinación de la resistencia al aplastamiento del ondulado de cartón corrugado".
NOM-EE-45-1977	"Tubos depresibles de plomo".
NOM-EE-46-1979	"Envases depresibles de estaño".
NOM-EE-47-1979	"Tapones invertidos o retapas de polietileno baja densidad".
NOM-EE-48-1979	"Sacos de polipropileno para envasar azúcar".
NOM-EE-49-1964	"Método de prueba para la determinación de la impermeabilidad de la herrica de madera para el transporte de óxido arsenioso".
NOM-EE-50-1961	"Papeles cubiertos (couchess)".
NOM-EE-51-1973	"Envases cilíndricos impermeables de cartón con recubrimiento de polietileno".
NOM-EE-52-1979	"Envase y Embalaje.- Terminología de contenedores".
NOM-EE-53-1979	"Envase y Embalaje.- Marcado de contenedores serie 1".
NOM-EE-54-1979	"Envase y Embalaje.- Dimensiones externas y resistencia de contenedores series 1, 2 y 3".
NOM-EE-55-1979	"Envase y Embalaje.- Terminología de tarimas".
NOM-EE-56-1979	"Envase y Embalaje.- Tarimas de madera.- Dimensiones".
NOM-EE-57-1979	"Envase y Embalaje.- Identificación de las partes cuando se someten a pruebas".
NOM-EE-58-1979	"Envase y Embalaje.- Acondicionamiento para pruebas".
NOM-EE-59-1979	"Envase y Embalaje.- Símbolos para manejo, transporte y almacenamiento".
NOM-EE-60-1979	"Envase y Embalaje.- Sellos o juntas cónicas de baja densidad".

NOM-EE-61-1979	"Envase y Embalaje.- Tapas de presión tipo cachucha de polietileno".
NOM-EE-62-1979	"Envase y Embalaje.- Método de prueba del plano inclinado".
NOM-EE-63-1979	"Envase y Embalaje.- Dimensiones internas de contenedores de carga serie I".
NOM-EE-64-1979	"Envase y Embalaje.- Dimensiones y capacidad de envases cilíndricos de hojalata".
NOM-EE-65-1979	"Envase y Embalaje.- Método de prueba del péndulo".
NOM-EE-66-1979	" Envase y Embalaje.- Tapas de presión de polipropileno y polietileno alta densidad para envases de aerosol".
NOM-EE-67-1979	"Envase y Embalaje.- Papel y Cartón.- Acondicionamiento".
NOM-EE-68-1979	"Envase y Embalaje.- Papel y Cartón.- Determinación de la masa base".
NOM-EE-69-1979	"Envase y Embalaje.- Papel y Cartón.- Determinación de la humedad".
NOM-EE-70-1979	"Envase y Embalaje.- Cajas de cartón corrugado engrapado".
NOM-EE-71-1979	"Envase y Embalaje.- Cartón corrugado.- Cajas tipo telescopicas para envasar cítricos en estado fresco".
NOM-EE-72-1979	"Envase y Embalaje.- Envases y embalajes de madera.- Terminología".
NOM-EE-73-S-1980	"Envase y Embalaje.- Metales.- Envases cilíndricos.- Sanitarios para contener alimentos.- Determinación de la hermeticidad"
NOM-EE-74-1980	"Envase y Embalaje.- Papel y Cartón.- Terminología".
NOM-EE-75-1980	"Envase y Embalaje.- Papel y Cartón.- Determinación de la resistencia al reventamiento".
NOM-EE-76-1980	"Envase y Embalaje.- Plástico.- Pasos rosca para cuellos".
NOM-EE-77-1980	"Envase y Embalaje.- Plástico.- Pasos rosca para cuellos de envases.- Determinación de las dimensiones".

NOM-EE-78-1980	"Envase y Embalaje.- Madera.- Cajas clavadas para envasar tomates.- Especificaciones".
NOM-EE-79-1980	"Envase.- Plásticos.- Botellas cilíndricas estandar de polietileno alta densidad.- Especificaciones".
NOM-EE-80-1980	"Envase.- Vidrio.- Pruebas de presión interna".
NOM-EE-81-1980	"Envase.- Vidrio.- Determinación de la resistencia al ataque químico".
NOM-EE-82-1980	"Envase y Embalaje.- Plástico.- Método de prueba para determinar la capacidad de botellas".
NOM-EE-83-1979	"Envase y Embalaje.- Tapas de presión de polietileno y polipropileno.- Dimensiones".
NOM-EE-84-1980	"Envase y Embalaje.- Envase de papel y cartón.- Determinación de la resistencia la impacto, método de caída libre".
NOM-EE-85-1979	"Envase y Embalaje.- Esquineros.- Especificaciones".
NOM-EE-86-1980	"Envase y Embalaje.- Madera.- Cajas de madera alambrada (jaba) para envasar cítricos".
NOM-EE-87-1980	"Envase y Embalaje.- Tarimas.- Pruebas".
NOM-EE-88-1980	"Envase y Embalaje.- Producto.- Determinación de la esistencia a la vibración".
NOM-EE-89-1980	"Envase y Embalaje.- Materiales amortiguantes.- Determinación de la respuesta a la vibración".
NOM-EE-90-1980	"Envase y Embalaje.- Contenedores.- Código de marcado para la identificación en su manejo".
NOM-EE-91-1980	"Envase y Embalaje.- Madera.- Cajas para envasar limones en estado fresco.- Especificaciones".
NOM-EE-92-1980	"Envase y Embalaje.- Vidrio.- Envases aerosol no recubiertos.- Especificaciones".
NOM-EE-93-1980	"Envase.- Plástico.- Tapas tipo rosca de polietileno alta densidad y polipropileno.- Especificaciones".
NOM-EE-94-S-1980	"Envase.- Metales.- Envases de hojalata para contener leche evaporada.- Especificaciones".

NOM-EE-95-1980	"Envase y Embalaje.- Madera.- Medición de defectos".
NOM-EE-96-1980	"Envase y Embalaje.- Papel y Cartón.- Cajas de cartón para envasar manzanas y peras en estado fresco".
NOM-EE-97-S-1980	"Envase y Embalaje.- Metales.- Envases de hojalata cilíndricos sanitarios para contener alimentos.- Medición de defectos".
NOM-EE-98-1980	"Envase y Embalaje.- Método de prueba de choque de envases y embalajes".
NOM-EE-99-1980	"Envase y Embalaje.- Textiles.- Terminología".
NOM-EE-100-1980	"Envase y Embalaje.- Textiles.- Jarcia de henequén".
NOM-EE-101-1980	"Envase y Embalaje.- Flejes.- No metálicos acordonados.- Especificaciones".
NOM-EE-102-1980	"Envase y Embalaje.- Flejes.- No metálicos extruidos.- Resistentes al agua.- Especificaciones".
NOM-EE-103-1980	"Envase y Embalaje.- Madera.- Determinación de la humedad".
NOM-EE-104-1980	"Envase y Embalaje.- Método de prueba del tambor rotatorio para envases y embalajes".
NOM-EE-105-1980	"Envase.- Metales.- Envases de hojalata para contener aceites comestibles.- Especificaciones".
NOM-EE-106-1980	"Envase y Embalaje.- Contenedores.- Métodos de prueba para determinar la capacidad de botellas".
NOM-EE-170 -1980	"Envase y Embalaje.- Contenedores.- Modelo aéreo.- Carga unitaria.- Marcado".
NOM-EE-108-1980	"Envase y Embalaje.- Papel y Cartón.- Determinación de resistencia al razgado".
NOM-EE-109-1980	"Envase.- Plástico.- Método de prueba para determinar la resistencia al impacto en botellas".
NOM-EE-110-1980	"Envase y Embalaje.- Contenedores modelo aéreo.- Métodos de prueba".
NOM-EE-111-1981	"Envase y Embalaje.- Contenedores modelo aéreo.- Especificaciones".

NOM-EE-112-1981 "Envase y Embalaje.- Cartón corrugado.- Método de prueba para determinar la compresión de canto".

NOM-EE-113-1980 "Envase y Embalaje.- Determinación de la permeabilidad al vapor de agua y gases en películas flexibles".

NOM-EE-114-1981 "Envase y Embalaje.- Vidrio.- Terminología".

NOM-EE-115-1981 "Envase y Embalaje.- Madera.- Método de prueba a la compresión".

NOM-EE-116-1981 "Envase.- Plástico.- Botellas de polietileno alta densidad.- Especificaciones".

NOM-EE-117-1981 "Envase y Embalaje.- Determinación del peso específico aparente en maderas".

NOM-EE-118-1981 "Envase.- Plástico.- Determinación de la permeabilidad de botellas".

NOM-EE-119-S-1981 "Envase.- Metales.- Métodos de evaluación de la exposición del metal para envases que contengan bebidas carbonatadas y cerveza".

NOM-EE-120-1981 "Envase.- Papel.- Bolsas para envasar café.- Dimensiones".

NOM-EE-121-1981 "Envase y Embalaje.- Madera.- Determinación de la resistencia a la compresión en dirección perpendicular al grano".

NOM-EE-122-1981 "Envase y Embalaje.- Madera.- Determinación de la resistencia a la compresión en dirección paralela al grano".

NOM-EE-123-1981 "Envase y Embalaje.- Cartón compacto y corrugado.- Determinación del coeficiente de fricción estática.- Método del plano inclinado".

NOM-EE-124-1981 "Envase.- Vidrio.- Clasificación de las Coronas".

NOM-EE-125-1981 "Embalaje.- Rectangulares de expedición dimensiones exteriores de la base".

NOM-EE-126-S-1981 "Envase.- Metales.- Evaluación del cierre en envases de hojalata sanitarios".

NOM-EE-127-1981 "Envase y Embalaje.- Madera.- Clavado de Cajas.- Especificaciones".

NOM-EE-128-1981 "Envase y Embalaje.- Madera.- Determinación de la resistencia a la extracción de clavos".

NOM-EE-129-1981 "Envase y Embalaje.- Contenedores Térmicos de carga unitaria para control de la temperatura interna.- Especificaciones".

NOM-EE-130-1981 "Envase.- Vidrio.- Coronas de Rosca.- Especificaciones".

NOM-EE-131-1981 "Envase.- Vidrio.- Botellas para contener bebidas gaseosas.- Especificaciones".

NOM-EE-132-1982 "Envase.- Madera.- Cajas para transportar aves de corral.- Especificaciones".

NOM-EE-133-S-1981 "Envase.- Metales.- Determinación de estaño libre y en aleación en envases de hojalata sanitarios".

NOM-EE- 134-1981 "Envase.- Textiles.- Determinación de la resistencia a la caída libre de sacos".

NOM-EE-135-1981 "Envase.- Textiles.- Henequén.- Sacos para Envasar Cacao.- Especificaciones".

NOM-EE-136-1982 "Envase y Embalaje.- Plástico.- Terminología".

NOM-EE-137-1982 "Envase y Embalaje.- Madera.- Determinación de la Flexión Estática".

NOM-EE-138-1982 "Envase y Embalaje.- Cartón Corrugado.- Pruebas básicas".

NOM-EE-139-1982 "Envase.- Plástico.- Botellas tipo capsulero con tapa rosca en polietileno alta densidad, polipropileno, PCV, y poliestireno.- Especificaciones".

NOM-EE-140-1982 "Envase.- Plástico.- Botellas tipo capsulero con tapa de presión en polietileno alta densidad, polipropileno, PVC, y poliestireno.- Especificaciones".

NOM-EE-141-1982 "Envase.- Cartón plegadizo.- Cajas utilizadas para envasar productos alimenticios deshidratados.- Especificaciones".

NOM-EE-142-1982 "Envase y Embalaje.- Plástico.- Acondicionamiento de materiales".

NOM-EE-143-1982	"Envase.- Plástico.- Películas Flexibles.- Determinación de la resistenica a la tensión del sellado".
NOM-EE-144-1982	"Envase.- Textiles.- Determinación de las dimensiones".

ANNEX VIII

ORIGINAL JOB DESCRIPTION MODIFIED

ORIGINAL JOB DESCRIPTION

DP/MEX/78/011/11-06/31.7.E

Post title:	Consultant in the Production of Paper and Cardboard Packages.
Duration:	4 months in 2 periods of 2 months each.
Date required:	April/May and mid. August/mid. October, 1981.
Duty station:	Mexico City, with travel within the country.
Purpose of project:	To consolidate the activities of the Mexican Institute of Assistance to Industry from the technical and performance points of view, with regard to its basic activities in the field of packaging. Particular emphasis is placed on enlarging, complementing and specialising the Institute's technological capabilities, in order to fulfil its role of providing the country with such permanent services as packaging information, standardisation, training, design, applied research, testing and quality control, and to advise on the appropriate development of the packaging industries.

Duties:

The activities of the expert will be agreed upon in co-operation with the national counterpart personnel and co-ordinated by UNIDO's project manager in the field. The expert will be assigned to the Mexican Institute of Assistance to Industry (IMAI) and will specifically be expected to:

1. Make a general evaluation of the paper and cardboard packages used in the country and assess how appropriate their present use is.

2. Make an appraisal of the raw materials, techniques and equipment used in the country for the manufacture of paper and

cardboard packages, both from the technological and economic points of view.

3. Carry out a study to assess whether the present production capacity of paper and cardboard packages in the country is sufficient to meet the demands foreseen for the next ten years.

4. Prepare a skeleton plan for the enlargement of the existing paper and cardboard manufacturing plants and/or for the establishment of new ones in order to meet the national demand for packaging materials during the next ten years. Feasibility studies on the execution of this plan should be organised.

5. Prepare the basis for a tentative programme to increase the recycling of paper and cardboard packaging materials in the country and to substitute imported raw materials whenever possible.

6. Give ad hoc advice on other matters related to the technology for the production of paper and paperboard packages according to requests received from the counterparts.

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 action which might be taken.

Qualifications: Packaging technologist with a university degree or equivalent experience. Professional specialisation covering the manufacture and utilisation of paper and cardboard packaging materials.

Language: English, Spanish an asset.

Background Information:

From January 1974 to December 1976 a project was implemented at the Mexican Packaging Institute which aimed at establishing a technological institution capable of carrying out specialised functions in the broad field covering information, training, standardisation, applied research and quality control. When the present Government of the Republic took up office, a temporary suspension of the project was requested until such time as the Government policy for the six year period had been defined.

The Mexican Institute of Assistance to Industry was later created by governmental decree, thereby integrating the Mexican Packaging Institute and the departments of design and industrial information from other institutions. The packaging sector has, however, been kept as the main field of application for the new Institute which, for the time being, has directed its design and industrial information activities exclusively towards the field of packaging.

The present project has been requested mainly to consolidate the activities of the Mexican Institute of Assistance to Industry, as described above.

The project includes a general study on the national demand for the products and on production facilities presently available in the country. A study on the complementary facilities to be installed locally in order to satisfy the national needs using locally available raw materials, manpower and appropriate technologies is also included.

LETTER TO MR. MANNING CONTAINING MODIFIED JOB DESCRIPTION AND PROGRAM FOR FIRST PART OF MISSION.

April 13, 1981

E. Manning
Acting Head
Agro Industries Branch
Division of Industrial Operations
UNIDO

Dear Mr. Manning:

Thank you for your letter of welcome dated 30th March, 1981 handled to me via Mr. Belo in Vienna on the occasion of my briefing session for the Mexican Project.

On arrival at LANFI I had discussions on the program with Mr. Madi, Co-Director and UNIDO Project Manager and Mr. Muñoz, Technical Manager responsible for the Paper and Board Packaging Group of LANFI.

As a result it is suggested and I am happy to accept the proposal, that I should concentrate on training LANFI personnel in the analysis and solution of packaging problems involving paper and board, to promote the cost effective utilisation of existing packs and materials. This you will see expands the work covered by the last two items in the original job description, placing more emphasis on the ad hoc requests and will of necessity reduce the time available for other parts of the assignment.

We have therefore prepared a modified job description a copy of which is attached.

You will also recall that this assignment is split into two parts and during my second visit, which we now suggest takes place between

../

August 18th and October 11th, 1981 it should be possible to devote more time to items 2, 3 and 4.

I trust this will meet with your approval.

Yours sincerely,

Frank A. Paine

c.c. Mr. Dañilo Jiménez
Resident Representative of UNDP

Mr. F. Fajnzylber
Senior Industrial Development Field Adviser

Mr. J.A. Careaga
Director General IMAI-LANFI

Mr. L.F.C. Madi
Co-Director UNIDO Project Manager

Mr. J. Belo
Industrial Development Officer Agro-Industries
Branch UNIDO.

PROPOSAL FOR DUTIES OF CONSULTANT IN THE PRODUCTION OF PAPER AND BOARD PACKAGES

1. Generally evaluate the paper and paperboard packages used in Mexico and assess their present appropriateness.

2. Make an appraisal of the raw materials, technique and equipment used in the manufacture of paper and board packages, both from the technological and economic view points.

3. Comment on the paper and board aspects of a study already made of the present production capacity for packaging materials in Mexico in the short and medium term.

4. Suggest means by which the use of recycled fibres domestically produced from waste paper and board could be increased and thus reduce imports of paper and board based packaging materials.

5. With the objective of achieving cost effective packaging in all product areas; and bearing in mind that 45-50% of all packaging is made from paper and board; to provide guidance to LANFI in the selection of test methods and procedures for specific purposes and to assist in the interpretation of their relevance to Mexican distribution systems and overseas transport requirements.

6. In particular to develop the above for the following media:

   a. Fibreboard cases and related packaging
   b. Folding boxboard cartons
   c. Paper bags and sacks.

   Development should cover testing at all stages of production and use and for both qualification and quality control purposes for industry, national and international standards.

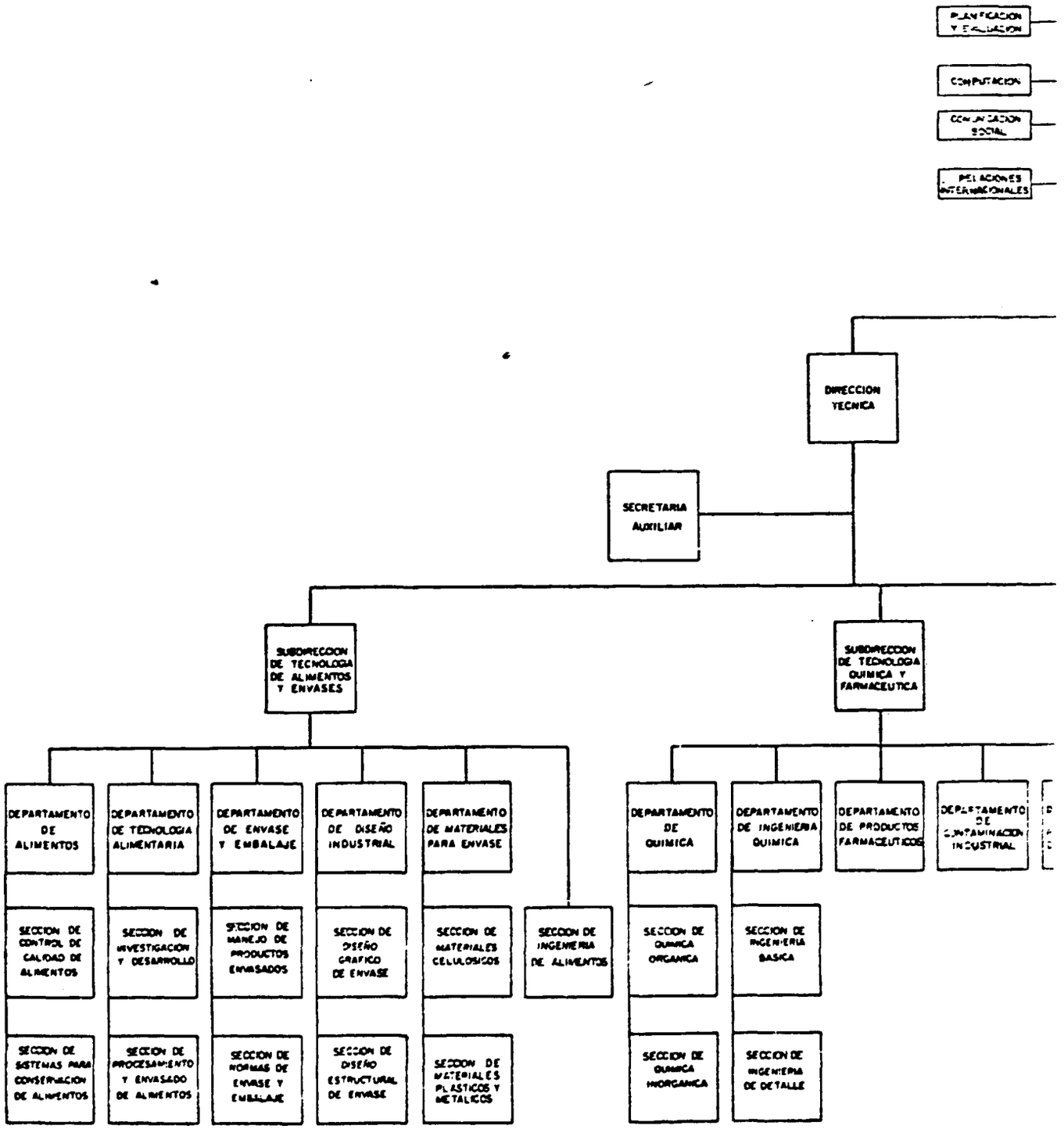
7. Provide guidance and assistance to relevant personnel at LANFI on the application of package and materials tests in the solution of packaging problems designed to:

   a. Reduce the overall costs of packaging and distribution where the technical performance of current packaging is satisfactory.

b. Improve the performance of unsatisfactory packaging or minimum increase in cost

c. Develop cost effective packaging for new products or new markets.

NEW STRUCTURE OF LANFI

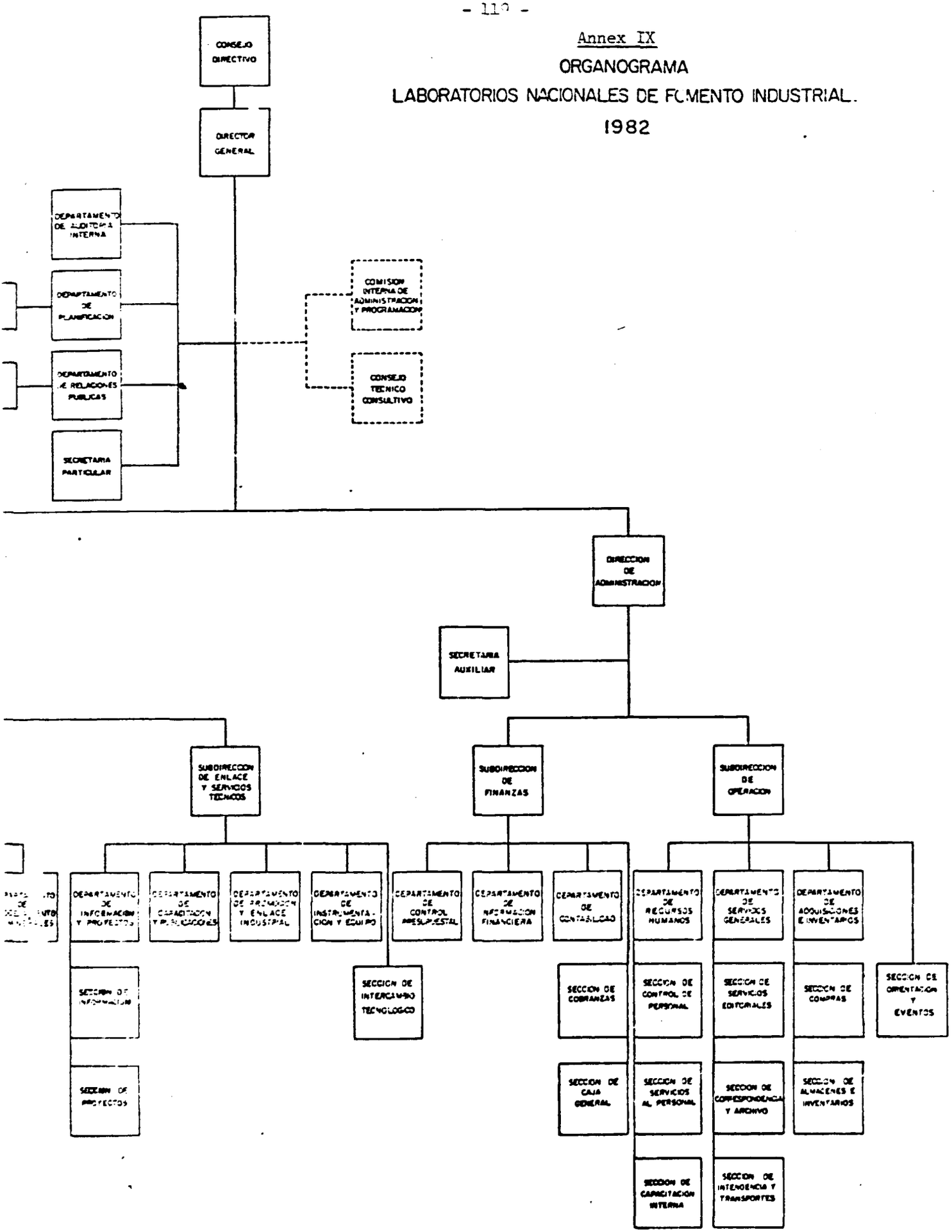


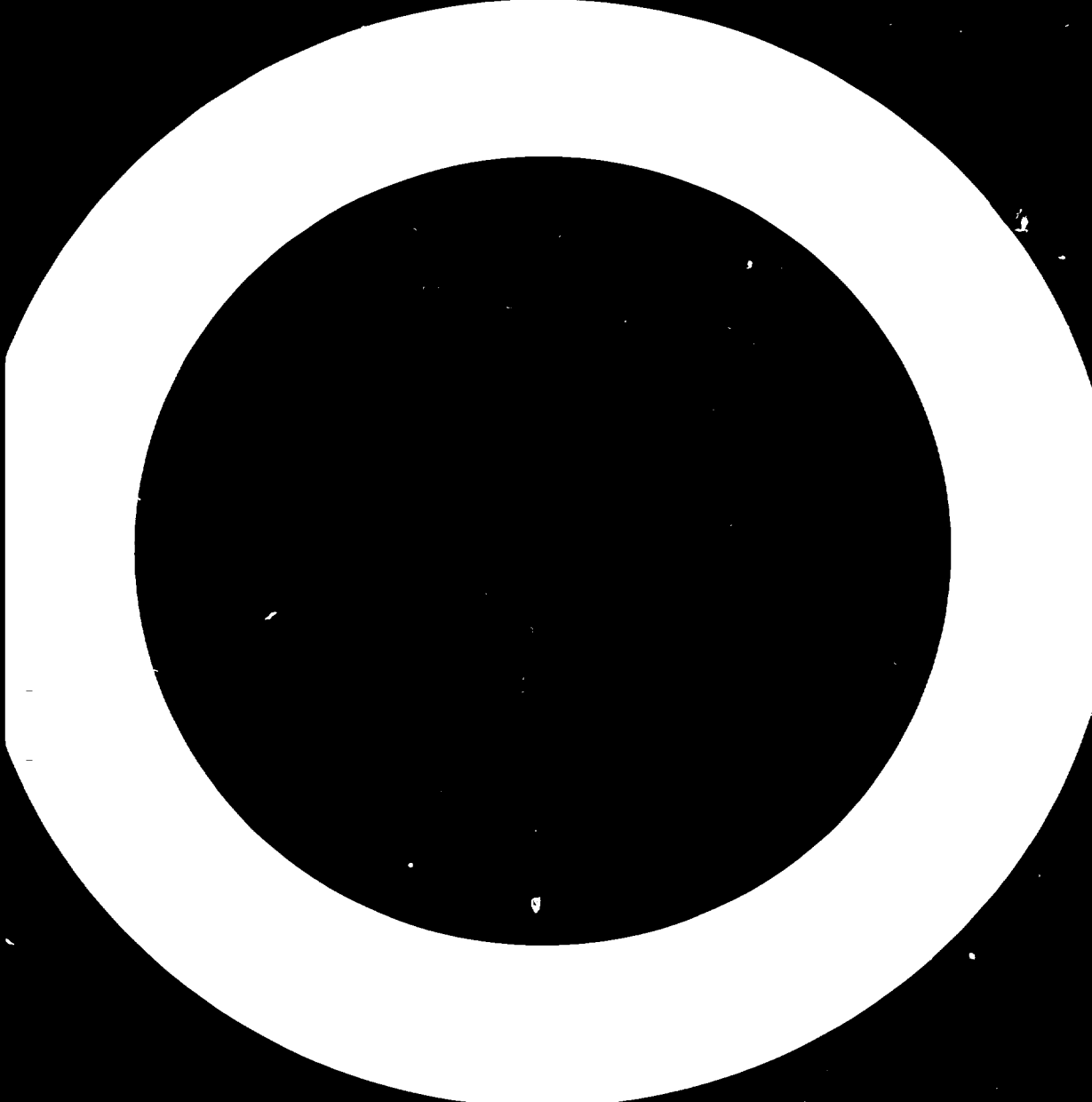
Annex IX

ORGANOGRAMA

LABORATORIOS NACIONALES DE FOMENTO INDUSTRIAL.

1982





ANNEX X

LIST OF BOOKS AND MAGAZINES RECOMMENDED FOR LANFI IN THE FOOD AND PACKAGING AREA

A. LIST OF BOOKS

FOOD AREA

1. ASTM - Basic principles of sensory evaluation
ASTM - Special technical publication 433-1968

2. ASTM - Special technical publication No. 440 - 1968
Correlation of subjective - Objective methods in the study of odors and taste

3. ASTM - Special technical publication No. 434 - 1976
Manual on sensory testing methods.

4. AURAND, L.W.; Woods, A.E. Food Chemistry. The Avi Publishing Company, Inc. 1973. Westport, Connecticut

5. CONSUMER AND FOOD ECONOMICS INSTITUTE. Nutritive value of foods. Home and Garden Bulletin. No. 72. 1971
USDA, Washington, D.C.

6. CRUESS, W.V. - Produtos Industriais de Frutas e Hortalicas
Volume I. Ed. Edgard Blucher, 1973. Sao Paulo

7. CRUESS, W.V. - Produtos Industriais de Frutas e Hortalicas.
Volume II. Ed. Edgard Blucher, 1973. Sao Paulo

8. DARRAH, L.B. - Food Marketing The Ronald Press Company - New York, 1967

9. DICKES. G.J. and Nicholas, P.U. - Gas Chromatography in Food Analysis. London, Boston - Butterworths - 1976

10. FOOD AND DRUG ADMINISTRATION - Bacteriological Analytical Manual for Foods. Division of Microbiology. Washington D.C.

11. FRAZIER, W.C. et all - Laboratory Manual for Food Microbiology fourth edition Burgers Publishing Company 1968. Minneapolis Minn.

12. GUITHER, H.D. - The food lobbysts - 1980. Lexington Books D.C. Heath and Company Lexington, Massachussets, Toronto

13. GRISWOLD, R.M. - Estudo Experimental dos Alimentos Ed. da Universidade de Sao Paulo, 1972. Sao Paulo

14. HEID, J.L.; JOSLYN, M.A. Fundamentals of Food Processing Operations Ingredients, Methods, and Packaging The Avi Publishing Company, Inc. 1967. Westport, Connecticut

15. HENDERSON, J.L. - The fluid milk Industry - third edition The Avi Publishing Company, Inc. 1971. Westport Connecticut

16. HERIEBERG R. et all. Putting food by the Stephen Greene Press - 1973-1974. Brattleboro, Vermount.

17. JACOBSON, M.F. - Eater's Digest . Doubleday & Company, Inc. -1972. Garden City, New York

18. KAREL, M; FENNEMA, O. and LUND, D.B. Principles of Food Science Part I and II. Marcel Dekkes, Inc. 270 Madison Ave. New York 10016

19. KOSIKOWSKI, F. - Cheese and fermented milk foods - third edition Published by the author, 1970

20. KRAMER, A; TWIGG, B.A. Quality control for the food industry Volume I. Fundamentals, third edition The Avi Publishing Company, Inc. 1970. Westport, Connecticut

21. KRAMER, A; TWIGG, B.A. Quality control for the food industry Volume 2 Applications Third edition The Avi Publishing Company, Inc. 1973. Westport Connecticut

22. LEVIE, A. The meat handbook - Third edition. Westport, Connecticut. The Avi Publishing Company Inc. 1970.

23. LOPEZ, A. A complete course in canning - ninth edition The canning trade Inc. 1969. Baltimore, Maryland

24. MEYER, L.H. Food Chemistry. The Avi Publishing Company, Inc. 1975. Westport, Connecticut

25. PFLUG, I.J. Syllabus for an introductory course in the microbiology and engineering of sterilization processes. May 1980. Environmental sterilization services. 10 East Oaks Road St. Paul. Mn 55110

26. PFLUG, I.J. Microbiology and Engineering of Sterilization Processes. November 1979: Environmental Sterilization Services 10 East Oaks Road. St. Paul Minnessota 55110.

27. POTTER, N.N. Food Science The Avi Publishing Company, Inc. 1968. Westport, Connecticut

28. POWERS, J.J. and MOSKOWITZ, H.R. Correlating sensory objective measurements new methods for answering old problems ASTM - Special technical publication 594.

29. PRUTHI, J.S. Physiology, Chemistry, and Technology of Passion Fruit. Central Food Technological Research Institute. Mysone, India

30. PYKE, M Synthetic Food. John Munay - London 1970

31. ROHR, R. A soja. Fonte proteica mais importante do mundo atual Palestra proferida na faculdade de tecnologia de alimentos da Universidade Estadual de Campinas.

32. RYALL, A.L.; LIPTON, W.J. - Handling transportation and storage of fruits and vegetables. Volume I - Vegetables and melons. The Avi Publishing Company, Inc. 1972. Westport, Connecticut

33. STEWART, G.F.; AMERINE, M.A. Introduction to food science and technology. Academic Press - New York and London - 1973

34. TRESSLER, D.K. et all. The freezing preservation of foods fourth edition Volume 2 Factors affecting quality in frozen food The Avi Publishing Company, Inc. 1968. Westport, Connecticut

35. TRESSLER, D.K. et all. The freezing preservation of foods. fourth edition Volume 3. Commercial food freezing operations Fresh foods. The Avi Publishing Company, Inc. 1968. Westport, Connecticut

36. TRESSLER, D.K.; JOSLYN, M.A. - Fruit and vegetables juice - Processing technology second edition The Avi Publishing Company Inc. 1971. Westport, Connecticut

37. USDA - Agriculture Handbook. No. 105. Protecting perishable foods during transport by Motortruck Agricultural Research Service - USDA

38. WATT, B.K.; MERRILL , A.L. Composition of foods Agriculture Handbook. No. 8 - 1963. Agricultural Research Service USDA Washington, D.C.

PACKAGING AREA

1. AGNEW, J., and HUNTLEY, J. Container Stowage. A practical approach Dover: Container Publications Ltd. 1972.

2. BRISTON, J.H., and KATAN, L.L. Plastic films London: Plastics Institute, by Butterworth & Co. (publishers) Ltd. 1974

3. BRISTON, J.H. And KATAN, L.L. Plastics in Contact with Food. Food Trade Press Ltd. London 1974.

4. BRITISH STANDARDS INSTITUTION- Methods of Testing Plastics BS. 2782: 1965. British Standards House, 2 Park St. London, W.I.

5. BRODY, A.L. Food canning in rigid and flexible packages Arthur D. Little, Inc. Cambridge, Massachusetts 1971

6. BRODY, A.L. Flexible Packaging of Foods. The Chemical Rubber, Co. 1970. Cleveland Ohio

7. BROWN, K. Package design engineering New York Wiley 1959. 263 p.

8. BRUINS, P.F. Packaging with Plastics 1974. Gordon and Breach Science Publishers

9. BRUINS, P.F.- Packaging with plastics New York: Gordon and Breach Science publishers Inc. 1974.

10. BRYDSON, J.A. - Plastic materials London: Newnes-Butterworth, 3rd. edition 1975

11. CAIRNS, J.A.; OSWIN, C.R.; PAINE, F.A. Packaging for climatic protection. Newnes. Butterworths 1974 London

12. CHOWDHARY, R.K. and SUBRAMANIAN, M.R. - Packaging laws and regulations 1978. Indian Institute of Packaging

13. CROMPTON, T.R. Additive migration from plastics into food. Oxford Pergamon press Ltd. 1979

14. EFFENBERGER G. and SCHOTTE, K. Empaquetado de la carne y productos cárnicos. Editorial Acubia Royo 23 Zaragoza 1972

15. EICHLER, J.R. - Wood pallet manufacturing practices Cape Coral FL: Eichler Associates 1976

16. EAHY, E.R. Guide to the packaging of hazardous materials Mc Graw Hill 1973. New York

17. FARKAS, R.D. - Heat sealing Reinhold Publishing Corporation New York 1964.

18. FARNHAM, S.E. - A guide to thermoformed plastic packaging Boston Mass: Cahner Books, 1972

19. FIBRE BOX ASSOCIATION. Box Competition 1974. Marketing in Action. Fibre Box Association Chicago, Ill. 1974

20. FIBRE BOX ASSOCIATION. Fibre box handbook. Chicago Illinois, 1971. 100 p

21. Handbook of corrugated boxes and products. Chicago, Illinois

22. FISHER, E.G. assisted by W hitfield, E.C. Extrusion of plastics. London: Newnes - Butterworth for plastics and rubber institute, 3rd. edition. 1976.

23. FISHER, E.G. - Blow molding of plastics 1971. Butterworth Group

24. FRIEDMAN, W.F. and KIPNESS, J.J. - Distribution packaging Huntington, New York: Robert E. Krieger Publishing Co. 1977.

25. FRIEDMAN, W.F. and JJ. KIPNEES. Industrial packaging New York Krieger 1975

26. FOOD INDUSTRY STUDIES No. 5. Packaging and packaging materials with special reference to the packaging of food. Austria

27. GRIFFIN, R.G. and SACHAROW, S. Principles of Package Development. The Avi Publishing Company, Inc. Westport, Connecticut 1972

28. GRIFFIN, R.C., Jr. and SACHAROW, S. - Drug and cosmetic packaging. Park Ridge, N.J.: Noyes Data Corp. 1975

29. GUINS, S.G. Notes on package design. 1975

30. HAGEN, J.D. Economics of the returnable glass bottle versus more materially flexible forms of milk packaging. A thesis

31. HANLON, J.F. - Handbook of Package Engineering. McGraw-Hill Book Company. 1971. USA

32. HARRISON, V.G.W. Evaluation of package performance. Printing, Packaging and Allied Trades Research Association Randalls, Road, Leatherhead, Surrey

33. HEISS, R. Principles of food packaging P. Keppler Verlag KG e FAO - 1970

34. HIGHAM, R.A. A handbook of paperboard and board, Vol. 1, Manufacturing technology and Vol. 2 Technology of conversion and usage. London: Business Books Ltd. 1971

35. HOARE, W.E. Tinplate handbook - Facts about tinplate for buyers and Tin Research Institute. Fraser Road, Perivale, Greenford

36. HOARE, W.E. and BRITTON, S.C. Tinplate handbook. Chemical and physical methods. Tin Research Institute Fraser Road, Perivale, Greenford

37. HOFFMAN, J.P.A. (Editor) - Dictionary of packaging. English German French Italian Spanish Russian. Heidelberg: Verlag fur Fachliteratur G.m.b.H., 1975

38. HULETT, M. Unit load handling London: Gower Press Ltd., 1970

39. INTERNATIONAL TIN RESEARCH INSTITUTE Second international Tinplate Conference London October 6th - 10th 1980. ITRI. Publication No. 600

40. JACKSON, J.M. Fundamentals of food canning technology. Westport, Connecticut: Avi Publishing Co. Inc. 1979,

41. JONES, A. Packaging of dairy products. London Wolpert and Jones, 1972. 200 p

42. KELSEY, R.J. Packaging in Today's Society 1978. St. Regis Paper Company

43. LANDROCK. A.H. Polyurethane foams technology, properties and applications. Dover, New Jersey, Plastics Technical Evaluation Centre, 1969. 254 p.

44. LEFAUX. R. Plastics materials in the food industry. Paris: Compagnie Francaise d'Editions, 1972, 559 pp.

45. LEONARD E.A. Introduction to the economics of packaging international and Pan American Copyright McGraw - Hill, Inc. New York 1968

46. LEONARD, E.A. - Packaging specifications purchasing and quality control. McGraw Hill Publication 1971. New York

47. LEONARD E.A. Packaging economics 1980. Books for industry Inc. 747 Third Avenue New York, N.Y. 10017

48. LOCK, A. Practical canning. London: Food Trade Press Ltd. 3rd. edition, 1969

49. LONG, R.F. Reference encyclopedia of package printing techniques and equipment. North American Publishing Company. Philadelphia 1973

50. LONG, R.P. Reference encyclopedia of package printing technique and equipment. Philadelphia: North American Publishing Co. 2nd. edition, 1973

51. MACCHESNEY, J.C. Packaging of cosmetics and toiletries. London: Butterworth and Co. (publishers) Ltd. in association with Institute of Packaging 1974

52. MACCHESNEY, F.M. and A. JONES. Economic factors in package design. London. Wolpert and Jones, 1973. 109 p

53. MACGUIRE, E.P. Packaging and paper converting adhesives. New York. Palmerton Publishing 1963

54. MILES D.C. e BRISTON J.H. Tecnología dos Polímeros Editora Polígono S/A. 1975

55. MILGROM, J. and BRODY, A. Packaging in Perspective. Arthur D. Little, Inc. 1974

56. MINDLIN, R.D. Dynamics of package cushioning. Bell System Technical Journal 1945

57. MODERN PLASTICS ENCYCLOPEDIA. Guide to plastics - Property and specification charts McGraw-Hill Inc. 1974 New York

58. MONTRESOR, J.M., MOSTYN, H.P. and PAINE F.A. Packaging evaluation. The testing of filled transport packages London: Butterworth and Co. (Publishers) Ltd. in association with institute of Packaging 1974.

59. MOODY, B. Packaging in glass. London: Hutchinson Benham Ltd., Rev. Ed., 1977

60. MOSHER, R.H. and DAVIS, D.S. Industrial and speciality papers Vol. 1. Technology New York: Chemical Publishing Co., Inc. 1968

61. MOSHER, R.H. and DAVIS, D.S. Industrial and specialty papers Vol. 2. Manufacture New York: Chemical Publishing Co. Inc 1968

62. MOSHER, R.H. and DAVIS, D.S. Industrial and specialty papers Vol. 3, Applications New York: Chemical Publishing Co. Inc. 1969

63. MOSHER, R.H. and DAVIS D.S. Industrial and specialty papers Vol. 4, Product Development. New York: Chemical Publishing Co., Inc. 1970

64. NATIONAL CANNERS ASSOCIATION. Principios de controle do processamento térmico e Avaliaçao do futamento de recipientes. National Canners Association. 1973. California

65. NEUBAUER, R.G. Packaging,the contemporary media. Van Nostrand Reinhold Company 1973. New York

66. OSWIN, C.R. - Plastic films and packaging. London: Applied Science Publishers Ltd. 1975

67. PACKAGING INSTITUTE - Glossary of packaging terms. The Packaging Institute Inc. New York 1967

68. PAINE F.A. Fundamentals of Packaging. Blackie and Son Ltd. London Glasgow 1967

69. PAINE, F.A. - Packaging evaluation. The testing of filled transport packages. Newnes - Butterworths 1974 London

70. PAINE, F.A. (Editor) The Packaging Media. Glasgow: Blackie and Son Ltd. for Institute of Packaging 1977

71. PAINE, F.A. (Editor) Packaging and the Law. London: Butterworth and Co. (Publishers) Ltd. 1973

72. PAINE, F.A. Packaging materials and containers. Stanmore, Middlesex, Institute of Packaging 1974. 377 p

73. PILDITCH, J. The silent salesman. How to develop packaging that sells. London. Business Books Ltd. 2nd Edition 1975

74. PINNER, S.H. ed. Modern packaging films. London, Newnes Butterworths 1967. 200 p

75. PIRA -

- Packaging developments in the UK fast-moving consumer goods industry
- Handbook of statistical sources
- Cost and availability of packaging 1980-1985
- Statistical and economical review of the packaging industries 1970-1978. France
- Volume and value of production in the packaging industries 1976-1978. West Germany and West Berlin
- Statistical and economic review of the packaging industries 1974-1978. Outlook 1979-1980 United Kingdom

76. RAPHAEL H.J. Packaging. A scientific marketing tool Michigan State University 1969

77. RAPHAEL H.J. and OLSSON, D.L. packaging production management 1978- The Avi Publishing Company Inc.

78. ROSS, C.F. Packaging of pharmaceutics London: Newnes-Butterworths for Institute of Packaging 1975

79. ROSSIN, M.S. A psicologia do anuncio sobre alimentos e o impacto que ele causa no consumidor. Relatorio 1973

80. SACHAROW, S. and GRIFFIN, R.C. Jr. Basic guide to plastics in packaging Cahners Publishing Company, Inc. 1973 USA

81. SACHAROW, S. and GRIFFIN, R.C. Food packaging - A guide for the supplier. processor and distributor The Avi Publishing Company, Inc. Westport, Connecticut 1970

82. SACHAROW, S. Handbook of package materials 1976. The Avi Publishing Company, Inc. Westport, Connecticut

83. SACHAROW, S. A packaging primer. New York: Magazines for Industry 1978.

84. SANDERS, P.A. Handbood of aerosol technology. New York: Van Nostrand Reinhold Co., 2nd. edition 1979

85. SCIARRA, J.J. and STOLLER, B.B.A. (Editors) The science and technology of aerosol packaging. New York: John Wiley and Sons, Inc. 1974

86. SHIELDS. J. Adhesives handbook. London: Newnes-Butterworth for Sira Institute Ltd. 2nd. Edition 1976

87. SINIA, R.J. Aluminium in packaging. Hilversum: Stamex BV Publishing Co. 139 pp

88. SWINBANK, C Packaging of Chemicals and other industrial liquids and solids. London: Butterworth and Co (publishers) Ltd. for Institute of Packaging 1973. 203 pp

89. SWALM, C.M. Chemistry of food packaging. American Chemical Society. 1974. Washington, D.C.

90. TABAK, H.D. Cargo containers: their storage, handling and movement, Cambridge, Maryland, Cornell Maritime Press. 1970. 386 p

91. TIN RESEARCH INSTITUTE. Tin versus corrosion. International Tin Research Institute. Publication No. 510. 1975

92. UNITED PARCEL SERVICE. Packaging for the small parcel environment. United panel service of America, Inc. 1971

93. VAN DEN BURG. G. Containerisation: a modern transport system London, Hutchinson and Company 1969. 219 p

94. VANDERGAER, J.E. ed. Microencapsulation: processes and applications New York Plenum Publishing 1974

95. VERPACKUNG AND KONSUMENT (Packaging and consumer) bern, Paul Haupt, 1967

96. WILLARD, H.H., LYNNEL, L. MERRITT and DEAN, J.A. Instrumental methods of analysis. D. Van Nostrand Company 1974

97. YOUNG, J.H. et al. Paper and board in packaging. Elmsford New York. Pergamon Press. 1963.

B. LIST OF PERIODICALS

FOOD AREA

1. Agroquímica y Tecnología de Alimentos
   Instituto de Agroquímica y Tecnología de Alimentos
   Jaime Roig, 11 Valencia España

2. Alimentación y Nutrición
   FAO - Dilitsa, Puebla 18
   Apartado 24-448

3. Analytical Chemistry
   Analytical Abstracts
   American Chemical Society
   P.O. Box 3337 Columbus
   Ohio 43210
   U.S.A.

4. British Food Journal
   Peterson Publishing Co. Ltd.
   Peterson House, Linery Street
   Birmingham B3 2PH
   England

5. Cereal Chemistry
   American Association of Cereal Chemistry
   3340 Pilot Knob Road
   St. Paul Minnesota 55121
   U.S.A.

6. Cereal Foods World
   3340 Pilot Knot Road
   St. Paul Minnesota 55121

7. Chemical Abstracts
   2540 Alentangy River Rd.
   Columbus, Ohio 43202
   U.S.A.

8. Critical Reviews in Food Science and Nutrition
CRC Press, Inc.
2000 N.W.
24th Street
Boca Ratón Florida 33431
U.S.A.

9. Food Engineering International
Chilton Company
Radnor Pa 19089
U.S.A.

10. Food Manufacture
Morgan Granpian House
30 Calderwood Street Wool
Urich London SE 186 H

11. Food Product Development
Arlington Publishing Co.
2 N Riverside Plaza
Chicago, I11 60606
U.S.A.

12. Food Science and Technology Abstracts
Common Wealth Agricultural Bureaux
Central Sales branch
Fornham Royal
Bucks
England

13. Food Technology
N. La Salle St.
Chicago, I11. 60606
U.S.A.

14. Food Technology in New Zeland
Trade Publication Ltd
P.O. Box 4260
Aukland, New Zeland

15. Fortune
CSIRO Food Research Quarterly
P.O. Box 52 North Ryde
N.S.W. 2113
Sydney Australia

16. Industria Alimentaria
Alfa Editores Técnicos
Libertad 107-402
México 13, D.F.

17. Journal of Agricultural and Food Chemistry
American Chemical Society
1155 Sixteenth St. N.W.
Washington D.C. 20036
U.S.A.

18. Journal of the American Chemical Society
1155 16th Street N.W.
Washington, D.C. 20036
U.S.A.

19. Journal of the American Oil Chemical Society
508 South Sixth St.
Champaign Illinois 61820
U.S.A.

20. Journal of the American Society of Information Science
John Wiley and Sons
Suite 210 1155 16th Street N.W.
Washington, D.C. 20036
U.S.A.

21. Journal of the Association of Official Analytical Chemists
Box 54, Benjamin Franklin Station
Washington, D.C.
U.S.A.

22. Journal of Food Biochemistry
Food Nutrition Press Inc.
265 Post Road West
Westport Connecticut 06880
U.S.A.

23. Journal of food process engineering
265 Post Road West
Westport Connecticut 06880
U.S.A.

24. Journal of Food Processing and Preservation
265 Post Road West
Westport Connecticut 06880
U.S.A.

25. Journal of Food Quality
265 Post Road West
Westport Connecticut 06880
U.S.A.

26. Journal of Food Science
221 N. La Salle Street
Chicago, Ill 60601
U.S.A.

27. Journal of Food Technology
I.F.S.T.
Oxford London Edinburgh
Boston Melbourne
England

28. Journal of milk and Food Technology
The International Association of Milk, Food and Environmental
Ames Iowa,
USA

29. Journal of Food Protection
The International Association of Milk, Food and
Environmental
Amex, Iowa
U.S.A.

30. Journal of the Science of Food and Agricultural
Blackwell Scientific Publications Ltd.
Osney Mead
Oxford OX2 OEL
England

31. Nutrition Reviews
The Nutritions Fundation Inc.
489 Fifth Avenue
New York, N.Y. 10017
U.S.A.

32. Tecnología de Alimentos
Indianápolis 63-2
México 18, D.F.

33. Tropical Storage Abstracts
P.F. Prevent Ph D
London Road, Slough SL3 7 HL
Buckinghamshire
England

34. Tropical Stored Products Information
P.F. Prevent B. SC. Ph D
London Road
Slough SL3 7HL
Bucks. England

PACKAGING AREA

USA

1. Packaging Digest
410 N. Michigan Avenue
Chicago, Illinois 60611
USA

2. Adhesives Age
Palmerton Publishing Company
101 West 31 st. Street
New York, N.Y. 10001
USA

3. Package Engineering
270 St. Paul St
Denver, Colorado, 80206
U.SA.

4. Packaging Technology
P.O. Box BPI
Winchester MA 01890
USA

5. Food and Drug Packaging
777 Third Avenue
New York, N.Y. 10017
U.S.A.

6. Alimentos Procesados
German Publishing Company
O'Hara Plaza 5725 East River Road
Chicago, Ill. 60631
USA

CANADA

7. Peter Cale Editor
Canadian Packaging
Mac Lean-Hunter Ltd
481 University Avenue
Toronto, Ontario M5W 1A7
Canada

ENGLAND

8. Editor
Packaging Abstracts
Pira Randalls Road
Leatherhead
Surrey
England

9. Editor
packaging Technology
Fountain House
1A Elm Park
Stanmore, Middlesex HA7 4BZ
England

10. Editor
FoodPack
4 Seaford Court 200
Gt. Portland Street
London W1N 5HH
England

11. Packaging
Monthly. Covers entire range of machinery, methods and materials from the production of the package, its filling, sealing and casing for transport to its display and ultimate use. Advisory service for subscribers on all packaging jobs
Publ: The Tudor Press Ltd.
9 Chiswick High Road
London EC4V 5ET, England

WEST GERMANY

12. Verpackung (Packaging)
Montly. In German. Covers packaging technology and psychology package design, marketing
Publ. Forster Veriag AG
Postfach 295
Ottikerstrasse 59
CH-8033 Zurich, Switzerland

13. Mr. Friedhelm Heydorn
Verpackings-Rundschau
8054 Mauern/Obb
Nelkenstrasse 7
West Germany

FRANCE

14. Mr. Pierre J. Louis
Emballages
40 Rue du Colisee
75008 Paris
France

ITALY

15. Imballaggio (Packaging)
Montly. In Italian
Publ. Etas Kompass SPA
Via Mantegna 6
1-20154 Milan,
Italy

JAPAN

16. Packaging
Packaging Co., Ltd.
Yagi Bldg, 5-3, 1-chome,
Kita-ueno,
Taito-ku 110 Tokyo
Japan

17. Packaging Japan
Nippo Co. Ltd.
4-5 Iidabashi 4-chome
Chiyoda-Ku, Tokyo 102
Japan

PORTUGAL

18. Actualidade de embalagem e acondicionamento
(Packaging and handling news)
Montly. In Portuguese
Publ. Actualidade de Embalagem & Acondicionamento
Rue Duque de Palmela 30-2 A
Lisbon, Portugal

19. Embalagem (Packaging)
Every two months. In portuguese
Publ. Instituto Portugues de Embalagem
Praca das Industrias
Lisbon 3 Portugal

BRASIL

20. Editor
Embalagems em revista
Rua Frei Canega 205
Sao Paulo SP
Brasil

21. Editor
Plasticos & Embalagem
Avenida Otaviano Alves de Lima 800
Sao Paulo SP
Brasil

VENEZUELA

22. Envase y Ebmalaje
In Spanish
Publ. Editorial Tucan, S.A.
Apartado 70.597
Caracas 107 Venezuela

ANNEX XI

LIST OF COMPLEMENTARY EQUIPMENT - PACKAGING AREA

1. Vacuum sealer machinery (for pouches)

   Company: MO-VAC II
   SWISSVAC
   MULTIVAC

2. Equipment for measuring the relative humidity and temperature Hygrodynamics 15-3050

   Company: American Instrument Company

3. Precision sample cutter for plastic material

   Company: Twing Albert Instruments Company

4. Hardness tester for Rockwell hardness testing

   Company:

5. Table for cutting, slotting and bending corrugated board

   Company: Local

6. PIRA Board Crearer

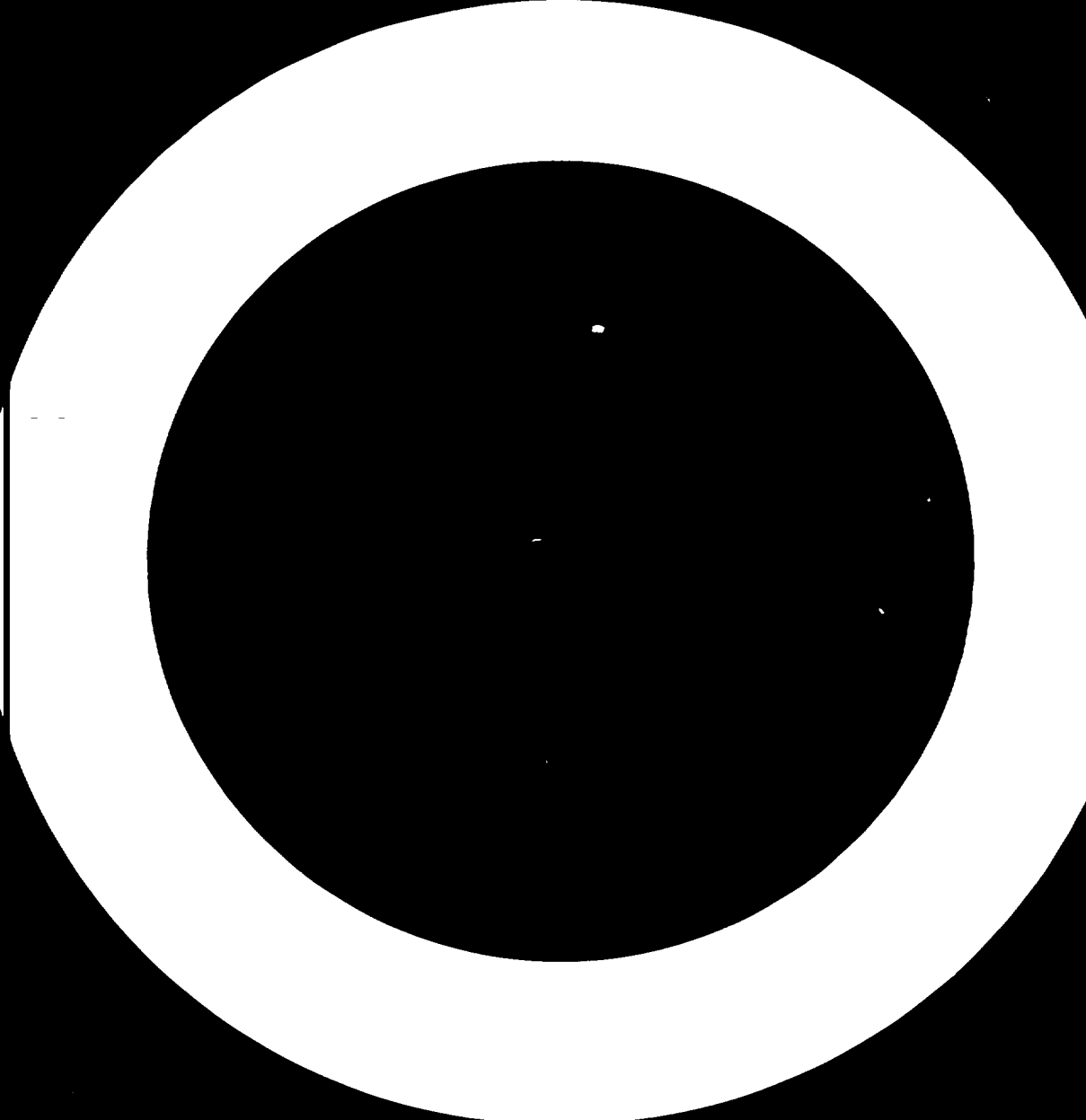
   Company: PIRA

7. PIRA Crearer Stiffness tester

   Company: PIRA

8. Specimen cutters

   Company: Local



ANNEX XII

LIST OF COMPLEMENTARY EQUIPMENT - FOOD AREA

1. Finisher (pulper)

   Company: F.H. Langsenkamp Company

2. Agitated cooker mixer (20-50 liters)

   Company: Growen Division, Dover Corporation

3. Homogenizer

   Company: APU or Gaulin Corporation

4. Centrifuge

   Company: Alfa Laval Inc.
   Westfalia Separator AG

5. Vacuum Kettle - pressure cooker

   Company: Hamilton Kettler

6. Universal Lab. Mill

   Company: Alprine American Corporation

7. Recorder - Multipoint (12 points) for temperature measurements with Cu - constant thermocouples

   Company: Honeywell
   Fisher

8. Dryers type cabinet

   Company: Procter and Schwaste