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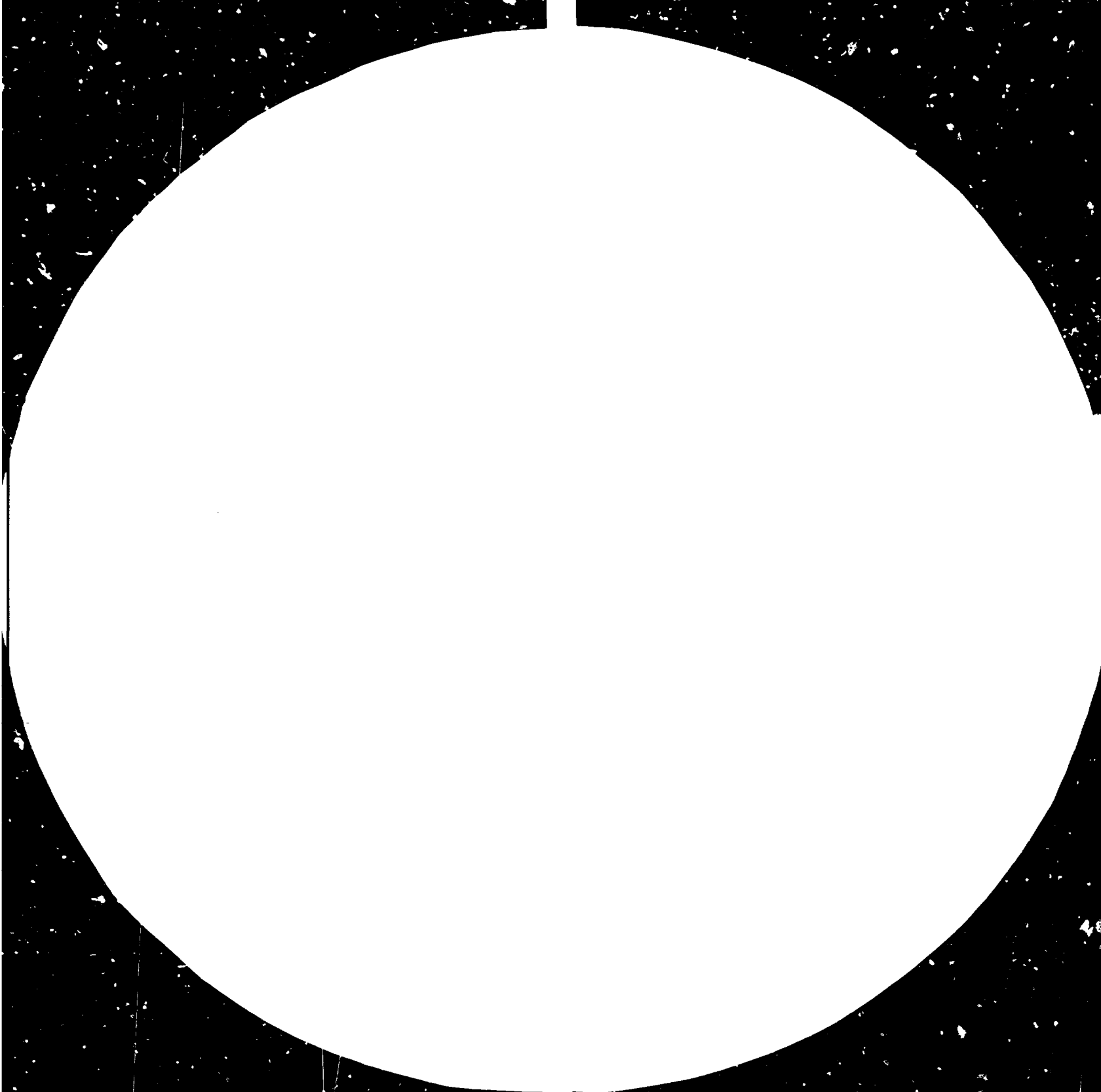
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(ANSI and ISO TEST CHART No. 2)

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5 July 1984
English

RESEARCH AND DEVELOPMENT IN FOOD PROCESSING
AND PACKAGING TECHNOLOGY

DP/MEX/82/010

MEXICO

Technical report: Packaging Standardisation*

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 P. K. Chowdhary,
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United Nations Industrial Development Organization
Vienna

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S U M M A R Y

The current economic realities prevailing in Mexico, make it imperative to conserve and improve foreign exchange resources, and progressively utilise indigeneous materials and processes vitally needed for achieving objectives of economic and industrial aspirations. The Mexican packaging industry has essentially to fall in line with programme of indiginisation. It must be recognised that the industry does not have sufficiently developed infrastructure to produce what it needs and have been producing output with highly varying quality. There is thus an apparent need to develop packaging standards and guidelines that can not only upgrade the packaging technology but also help the user industries to procure the right packaging material and packages.

Although a number of packaging standards do exist in the country, but industry's reponse to adopt these had been poor so far. To remedy the situation, it is crucial to have initiative and involvement of the various segments of packaging material, converting and users industries - right from the stage of problem identification to formulation of standards. A series of measures to solicit such cooperation have been high - lighted.

A review of industrial and agriculturial production of the country would indicate that a large percentage of the production is lost in the distribution system. The formuiation of standards and desireable practices for packaging of food, pharmaceutical products and consumer good needed by the -

common man merit the highest priority. Of equal importance are the standards of packaging for exports. All future work in the area may have to be addressed to these national priorities. Specific products and the associated packing material have accordingly been identified.

The adoption of standards and practices among other things, is highly related to the status of packing technology obtaining in the country. The packaging and related manufacturing machinery manufacturers are required to play their roles effectively by upgrading their operations. The domestic packing machinery manufacturing industry is at a nascent stage. It needs all encouragement and facilities by way of import of know - how, mother machine tools and scarce raw material and components to produce the necessary equipment and machinery.

The initial thrust and emphasis on upgrading packaging - technology for food and pharmaceutical products and for - exports, it is envisaged will have a 'spin off' effect in upgrading packaging technology needed in other segments of the industry.

The task of formulation of standards that are beneficial to the industry and the country is not only gigantic and complex but requires technical and organisational abilities 'par excellence'. LANFI'S resources of technical and organisational expertise with the cooperation of industry, transport carrier, Government departments and D.G.N., it is felt should be able to accomplish the task.

2. INTRODUCTION

2.1 - BACKGROUND

The UNIDO's programme of assistance to Mexico in the field of packaging commenced in July 1979.

The programme implementations has already covered various facets of packaging in the context of Mexico's distribution system, more particularly relating to food and consumer goods.

The programme was assigned to LANFI to act as a source for providing guidance, technical services and training to various packaging and related industries.

Accordingly, UNIDO's inputs of providing technical equipment and other facilities were and are being provided to LANFI.

On account of current recession and economic contingencies, the federal government considers it essential to conserve foreign exchange resources through a series of budgetary and fiscal controls and also to follow programmes and policies that could lead to utilisation of domestically produced packaging material, packaging machinery and other related products. In line with such a national endeavor, it became vital to reassess the relevancy and feasibility of packaging standards and specifications under the changed circumstances and to elaborate an integrated plan for formulation of standards of packaging material and packages and packaging technology - that could fit into the national requirements and promote exports. The present mission was intended to accomplish the above mentioned task and to highlight the strategies that could be adopted to achieve results at an accelerated pace.

2.2 - JOB DESCRIPTION

The terms of reference of the mission as proposed by UNIDO are enclosed at appendix I. However, subsequent discussions held between Mr. Tomas Rodríguez WEBER, Director General - SECOFIN; Director General, Sub Director General, Director Planning and Promotion - Director Technical - of LANFI and the consultants Mr. Frank Paine and Mr. Rk. Chowdhary, resulted in the preparation of a document incorporating priorities and the direction in which work was to be carried out and this document may be seen at appendix II. The development and adoption of packaging standards for food and general consumer goods, and for exports with the maximum reliance on indigenous packaging material are of utmost importance to the country. The consultant carried out the mission within this broad frame work.

2.3 - PLAN OF WORK

A plan of work was prepared to investigate the various issues involved by combining field and desk research, together with holding of discussions with experts of DGN, LANFI, SECOFIN, and fellow consultants.

The members of LANFI Staff engaged in this work of standardisation, accompanied the consultant to have a first hand knowledge of the prevailing conditions and the extent to which packaging standards are followed in practice. Such an orientation, did provide an opportunity to identify few possible areas and environmental factors that should be considered in the process of packaging development and formulation of standards and specifications.

3. DESCRIPTION OF WORK CARRIED OUT
AND RESULTS.

3.1

PACKAGING STANDARDS- CURRENT STATUS AND
FUTURE DIRECTIONS.

3.2

THE SITUATION ON PACKAGING STANDARDS FORMULATED IN MEXICO
CAN BE DIVIDED INTO FOUR BASIC CATEGORIES.

- (I) Standards relating to packaging styles constructions,
dimensions, quality and terminology.
- (II) Relating to materials or components used in packaging.
- (III) Relating to test methods and or testing equipment.
- (IV) Relating to distribution of goods.

A great deal of effort had been put in to formulate a number of standards in each of the areas and notifications were issued by D. G. N. from time to time.

No reliable information is available about the extent to which these standards are being implemented by the industry. Nor any attempt has been made to assess the status of implementation of these standards and industry's frank and firm opinion on the relevancy of these standards to the situation obtaining in Mexico. During field visits undertaken by the consultant, it was discovered that industry's awareness about the existence of such standards, leave alone, their implementation is at a very low level. Even

in a food processing and packaging unit, the facilities for validification of specifications for packaging material coming in direct contact with the products packed are - conspicuously absent. Often, the emphasis in a majority of the packaging material converting units, and the package users industries seems to be on the quantitative features of production and supplies. Neither the suppliers of materials, finished packages (with few notable exceptions) nor their consumers attach sufficient importance to ' technical attributes of the packages in relation to the products packed. Availability of right supplies is taken for granted.

3.3

Facilities for material testing available with manufacturers of packages particularly those engaged in the manufacture of corrugated board and boxes, paper sacks, plastic bottles, closures, plastic sacks - are extremely inadequate to afford an objective assessment of the specifications of the material these industries convert. For doing so, reliance is placed on experience and visual inspections and the customer's - (package user) complaints. Such a state of affairs is - least prudent to ensure quality inspection of material at the time of purchase and to initiate steps for in process quality control.

3.4

Product based packaging standards are by and large missing in the country. It is important that minimum standards of packaging for essential products' and commodities consumed by a majority

of the population should receive priority attention vis-a-vis those for others. For instance, standards for packaging of salt, edible oil, milk, rice flour, wheat flour, pre-packed sugar, pulses, bread, spices and other consumer goods of every day use don't exist. On the other hand, in the distribution system, one comes across a number of instances where certain essential foodstuffs are being sold using excessive packaging material. One can not rule out the possibility of consumer's being deceived perhaps inadvertently by this process of deceptive packaging. It is desirable to protect the consumer by enacting legislation that certain products - particularly essential foodstuffs would be sold in specified quantities - the mention of which should be prominently displayed on the container. It is desirable to develop a range of standardised capacities of these products - to avoid undue wastage of resources. For instance, for liquids, containers of capacity sizes 100 ml, 250 ml, 500 ml, 750 ml, 1 litre and for solids 125 g, 250 g, 500 g, 750 gm, 1 Kg, 2 Kg, 4 Kg. - - - - may be viable and desirable propositions.

It is equally important to mention the date of packaging together with date of expiry for foodstuffs in danger of being spoiled over a period of time.

3.5

Distribution System.-

The need to reduce damages suffered by products and produce in the distribution system is of paramount importance to the economy.

The distribution channel offer enough opportunity for cost reduction. No organised studies and steps to effect economies in the distribution systems for damage/loss prone - commodities/ products have come to the notice of the consultant. Improvements in the standards of packaging, handling, storage and haulage are part of the integrated system of logistics. A system approach to tackle the problem is called for. For instance, effecting improvements in packaging alone without commensurate improvements in other segments would serve only a limited purpose. By and large, there is a lukewarm concern for proper handling and storage of many a packaged products.

3.6

Standard NOM EE - 59 - 1979 relating to Packing-Symbols for handling, transport and storage formulated mainly in conformity with the International Standards on markings, in practice, lacks national relevance in certain respects. The symbol for protection against fire for - storage of inflammable products, could have been incorporated.

Similarly, the symbol for protection against cold Fig. 10 of the standard could not be well interpreted. Symbolic interpretation easily understood by the target audience for packages meant for domestic distribution - is suggested.

3.7

Premature/accelerated aging of packaging material in storage, poor stacking of filled packages, inadequate ventilation -

faulty lay out of stores, improper stock management-(first come - last go) harsh and rough material handling' are some of the shortcomings witnessed during field investigations.

Massive capital resources are needed to modernise warehouses and stores in the long run.

However in the immediate future, a great deal of productivity improvements and loss prevention can be achieved by method improvements, and adoption of better techniques requiring human skills and ingenuity.

Systematic lay out of storage space, proper methods of stacking, stock movements (first come first go) and handling can be effective instruments in loss minimisation programmes.

3.8

IMPROVEMENT in methods of filling and closing of wooden boxes and crates, baskets, sacks, plastic trays, used for fresh vegetables and fruits and their proper storage can reduce losses substantially. The tendency is to fill the containers to the level where it starts overflowing or fill it to its level of incapacity and press the respective closure, secure it with nails, or cover the opening with straw or polyethylene film, or used paper or basket lid as the case may be and bind it with sisal cord/string.

Top layers of cramped and bruised apples, softened and loose skin mango, crushed and spoiled plums, cherries, peaches; tomatoes, are some of the painful results of faulty filling and closing of packages-

Otherwise considered transport worthy containers. Some of

examples portraying this phenomenon are highlighted through photographs of the situation obtaining in the wholesale market. It is practical to minimise such losses by proper education of growers and wholesalers in the methods of filling and closing.

4.0

Quality control of cans in the food industry is done more by exception than as essential procedure of production. When trouble or failure is reported, the problem is tackled as a trouble shooting arrangement. Adherence to predefined specifications for cans and their evaluation at the time of purchase in the food industry is practically non existant. Quality of can is not guaranteed by the manufacturers particularly for those made out of Mexican tin plate.

Generally, lack of information concerning quality of packaging material of domestic and foreign origin may be the source of creating problems of corrosion, off flavour - from diffusion of some constituents from the oleoresinous based lacquer, lacquer peeling, etc., rather than the faulty processing.

5.0

FUTURE PROGRAMME OF PACKAGING STANDARDISATION.

5.1

In the context of the current economic policies aimed at the maximum reduction in the use of imported packages and materials in Mexico and increasing the utilisation of indigenous materials, it is envisaged that the standards and specifications for locally produced packages and material may have to be developed and reviewed with utmost speed and urgency. National considerations also demand the formulation of these standards for food and consumer goods and products meant for exports on a priority basis.

Without properly assessing the technical and technological feasibilities of the production mechanism in the industry and its preparedness to adopt the change; any hasty introduction of indigeneous materials for certain application areas may be prove to be commercially counter productive. It is therefore advisable to effect the substitution of imported materials with the indigeneous ones in a planned manner without causing any heavy strain on the existing national capacities.

5.2

Attempts to highlight possible future directions for formulating/adopting and or implementing the existing standards more intensively have been made on the basis of work done by the consultants during their missions in Mexico, discussions held with informed opinions during the current mission on the spot observations made in the field and consultant's own experience on the subject in other developing countries that have faced similar situations. While making the suggestions, the consultant has presumed that the Mexican industry's production mechanism is elastic enough to facilitate the utilisation of indigeneous

packaging materials to the maximum extent within the shortest possible time. However this hypothesis needs to be - validated by undertaking a quick survey of the packaging and users industries and assess their flexibility to - adopt the change. This would be more relevant to industries which have high speed packaging lines.

5.3

Within the broad frame work of economic priorities, - future programme of work relating to packaging standards may embody:

- a) Packaging standards for basic commodities, processed food and general consumer goods
- b) Packaging standards for exports
- c) Guide lines for packaging specifications for principal products in Mexican's imports to help achieve handling, storage and transportation economies, minimise losses and achieve maximum packaging economies.

6.0

Packaging standards for basic commodities,
processed food and general consumer goods.

6.1

Fiscal and budgetary controls on import of packaging material are likely to make the use of tin containers, paper and - paper based packages (due to use of imported pulp in paper -

manufacture) less attractive to the package user industries.

The situation may lead to:

- (1) More efficient use of scarce material by the package manufacturing industries by design changes, introduction of production economies, reducing waste and absorbing the rising costs in order to remain competitive;
- (2) Seeking a progressive reduction in the use of imported material by import substitution and or use of composite material such as poly laminated board, cartons, polycoated paper wrappers and or by constructional modifications;
- (3) Over a period of time, creating a production base more attuned to the production of packages based on indigeneous raw material.

6.2

Future emphasis on formulation of packaging standards may have to be on products such as milk, powdered milk, infant foods, eggs, bread, fresh fruits and vegetables, edible oil, processed fruits and vegetables, soft drinks/carbonated beverages, salt, detergent, pharmaceutical products, food grains, fertilizers - cement, acids and chemicals, pesticides and insecticides etc.

In addition, formulation of standards and specifications for transport packages to minimise the incidence of losses in the distribution system - merit immediate consideration. Equally important are the standards for testing what is relevant and related to provide data on adequacy or otherwise of packaging material and packages. Suggestions for each of these categories have been made and details may be seen in the statement given below.

Of prime importance are the packaging standards that are product oriented. Suggestions to formulate standards for these items in respect of prospective materials - identified have been made. The over-riding considerations of their suitability for use, availability from indigenous sources and easy machineability have been the basis for arriving at the results. Details about the present medium/media of

packaging, their likely trends in order of preference have also been enumerated together with suggestions for formulation of standards. In the immediate future, in the opinion of the Consultant, these items require urgent attention for formulation of packaging standards or code of practices. For accomplishing these, LANFI's resources are considered to be sufficient.

FORMULATION OF PACKING STANDARDS
OR CODE OF PRACTICES

CONSUMER PACKS.

PRODUCT	PACKING MEDIUM/MEDIA	STANDARD (STD) Or code of Practice (CP)
1 PASTEURIZED MILK	COEXTRUDED polyethylene pouches (1/2-litre- capacity) 1 lt.	STD STD
2. POWDERED MILK	1. BAG IN CARTON 2. PAPER/LDPE/ FOIL LAMINATED POUCHES	STD FOR POWDERED MILK IN PLASTIC FILM OR LAMINATED POUCHES.
3. BABY INFANT FOOD	1. BAG IN A BOX 2. GLASS CONTAINERS	STD FOR PACKING OF INFANT FOOD IN PLASTIC FILMS. - REVISION OF STD NOM EE-
4. BREAD	- POLYETHYLENE/POLY PROPYLENE - WRAPPERS	STD FOR WRAPPING BREAD IN PLASTIC FILMS.
5. EDIBLE OIL	- HDPE BLOW MOULDED CONTAINERS - PVC CONTAINERS	STD STD
6. PRESERVED FRUIT JUICES,	- HDPE BLOW MOULDED CONTAINERS - PAPER-POLY-FOIL LAMINATED RETORT-POUCHES - LAMINATED CARTONS (PURE PAK TYPE)	STD STD STD
7. PRESERVED FRUITS AND VEGETABLES	- GLASS BOTTLES	STANDARDS FOR SIZES AND CLOSURES.

PRESERVED FISH	- GLASS BOTTLES	STD
8. HAM FROZEN	<u>PE</u> STRETCH FILM	CP
9. MARGARINE	GREASE PROOF PAPER POLYETHYLENE FILM WRAP	CP CP
10. PHARMACEUTICAL PRODUCTS	POLYETHYLENE BOTTLES FVC BOTTLES	1. STD FOR PLASTIC CONTAINERS FOR PHARMACEUTICAL USE. (a) PARENTERAL AND OPHTHALMIC PREPARATIONS. (b) OTHER THAN PARENTERAL AND OPHTHALMIC PREPARATIONS. 2. CHILD RESISTANT PACKAGES 3. PILFER PROOF CAPS.
11. TABLE SALT	LD POLYETHYLENE BAGS	STD
12. SOAP CAKE	POLY COATED PAPER, WRAPPER WAX COATED, - PAPER WRAPPER.	STD FOR WRAPPING OF SOAP IN CAKE FORM.
13. COFFEE POWDERED	METALLIZED FILM-POLY-METALLIZED " POUCHES	STD
14. PASTA/NOODLESS	- POLYPROPYLENE WRAPPER	CP
15. INSECTICIDES (HOME PRODUCTS)	- HDPE BOTTLES (SPLASH - TYPE) - GLASS BOTTLES AEROSOL	STD STD
16. DETERGENT POWDER	POLYETHYLENE BAGS FOLDING CARTONS	STD FOR PACKING OF DETERGENT POWDERS/ GRANULES

BULK PACKS

17. CEMENT	MULTI LAYER PAPER SACKS	STD
18. ACIDS AND CHEMICALS	HDPE BLOWN JERRY CANS AND DRUMS	STD
19. SUGAR	TEXTILE SACK	STD
20. COFFEE SEEDS	POLYETHYLENE LAMINATED SACKS POLYPROPYLENE BAGS	STANDARD
21. FRESH FRUITS	WOODEN CRATES WOODEN BOXES	STANDARD FOR FILLING, CLOSING AND HANDLING
22. FRESH VEGE- TABLES	HENEQUENE SACKS POLYETHYLENE SACKS WOVEN EXTRUDED.	CP

7.0

STANDARDISATION OF PACKAGES FOR EXPORTS

7.1

Of the total exports of Mexico, USA accounts for nearly 70 percent of its' earnings. In the sphere of packaging, fresh fruits and vegetables - frozen shrimps, beer, alcoholic drinks, tobacco and certain selected chemicals require special considerations.

FRESH FRUITS AND VEGETABLES:

DIRECCION GENERAL DE NORMAS COMERCIALES

-(DGN) had issued guidelines for packaging of fresh fruits and vegetables for exports in 1932. These relate mainly to styles, construction, capacity, dimensions, shape, choice of material for different fruits and vegetables spread over 39 items. Wooden crates-rigid and collapsible; corrugated fibre board boxes and sacks are recommended for different products; specimen of these recommendations is enclosed at appendix IV.

7.2

It is suggested that these recommendations made, after due incorporation of the specification of material and components needed for construction of packages along with testing guidelines, should be given a full trial. Specification details for a few selected products are already available with LANFI and can be incorporated immediately. Whenever these are not available, LANFI

is competent enough to develop these.

7.3

The export of fresh fruits and vegetables is stipulated to be made in corrugated fibre board cartons except for situations where the importers have specified the use of other materials. Due to the inherent weaknesses in the domestically manufactured corrugated fibre board boxes, the exporters, it is learned, prefer to import these - from U.S.A. under bond and despatch their products in these boxes. This practice does not do any credit to the national packaging industry. Inherent weaknesses in the paper used as a liner is mainly responsible for such a malady. In the near future, it is unlikely that the national paper manufacturing industry would be able to supply the right Quality of liners produced out of 100 percent virgin pulp. With a view to encouraging the use of indigenous manufactured corrugated cartons, construction modifications may be required to make it suitable for exports and for the domestic market.

It is important that immediate steps should be taken by LANFI to work out constructional modifications on the basis of simulated trials and recommend these to the C.F. board box manufacturers and their users.

7.4

LABELS: It is advisable to standardise the graphics, sizes, and colour scheme of the labels except for the

colour and pictures of different products. This move may in the long run help establish a brand of Mexican's fruits and vegetables amongst the customers in the target markets. Attention is invited to regulation 158/66 of 1968 of the UNITED NATIONS - ECONOMIC Commission for Europe - that requires the fresh products must be identified according to standards issued which may serve as a reference guide.

7.5

INSPECTION

Inspection by representatives of the fruit growers association or the government agency for the quality of products exported - is considered desirable to promote the confidence of the importers. A seal of inspection label is recommended. This agency should also inspect the adequacy or other wise of the packages - labels, etc.

7.6

SEA JOURNEY WORTHY PACKAGES: The guidelines developed for packaging of fresh fruits and vegetables have been mainly for exports to USA effected largely by road. Future endeavours of exporters and Government aim to export Mexican fruits to certain destination markets in Western Europe by sea. Most of the current recommendations may have to be tested and modified to improve their suitability to face hazards of the sea journey intermodal transportation and multiple handling.

7.8

FROZEN SHRIMPS: Packaging requirements for frozen shrimps meant for exports to U.S.A. are specified by the importers. Code of practices and standards for such export packages have been developed by countries like India, Japan. Normally, waxed duplex board printed cartons containing 5 lbs or 2.5 Kg of shrimps in frozen form, and 10 of such cartons are placed in waxed c.f. Board boxes and exported in refrigerated containers by sea.

7.9

TOBACCO: Tobacco exports to USA are mainly by road. It is considered desirable to develop a standard for export of tobacco in wooden boxes. Tobacco can also be sent in compressed bales with a HENEQUENE wrap, It is worth while to explore this possibility and develop a code of practice.

7.10

FRESH FLOWERS: Mexican varieties of fresh flowers can be marketed in USA in adequate packages suitable for transportation by AIR. With proper packaging, the shelf-life of fresh flowers can be enhanced upto 36 - 48 hours. Packaging development work should be taken up by LANFI and a code of practice developed for the purpose.

MARKET SCENE

STRAW COVERED MANGOES
IN WOODEN CRATES



BRUISED PAPAYA



DAMAGED PAPAYA
(FAULTY STACKING)



SALE DEGRADED MELON



AVOCADO IN EXPORT PACK - NO
SEPARATORS USED



LEMONS IN WOODEN CRATES - POSSIBLE
CHANGE OVER TO SACKS USEFUL



OVER PACKED CARROTS



LOOSE DELIVERY OF CAPCICUM



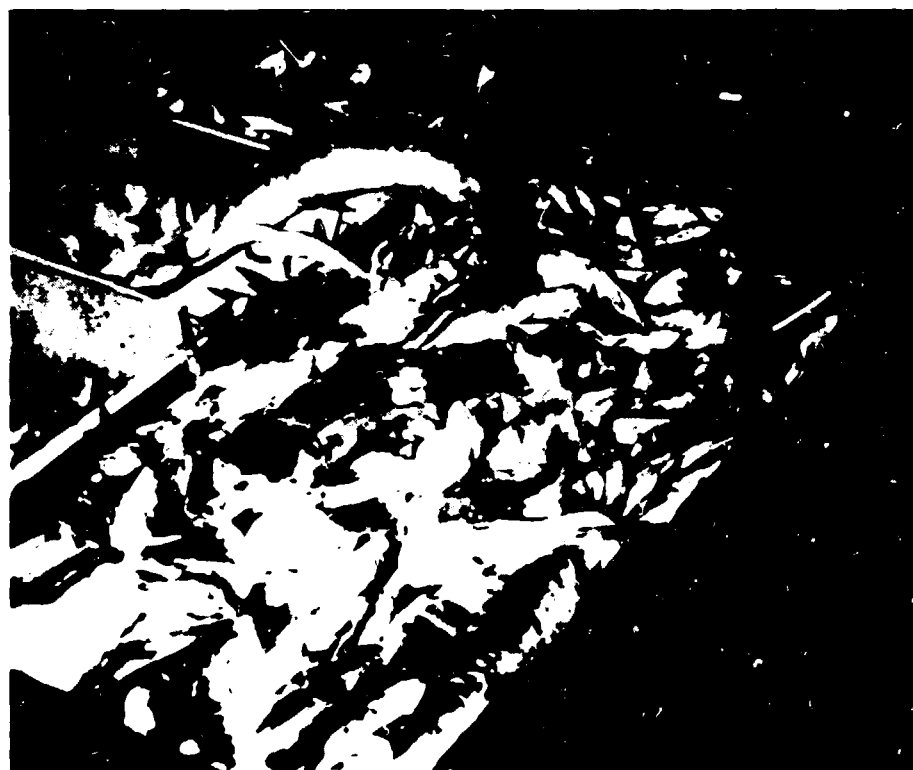
RETAIL SALE OF SEAFOOD - A REASONABLY
GOOD STORE



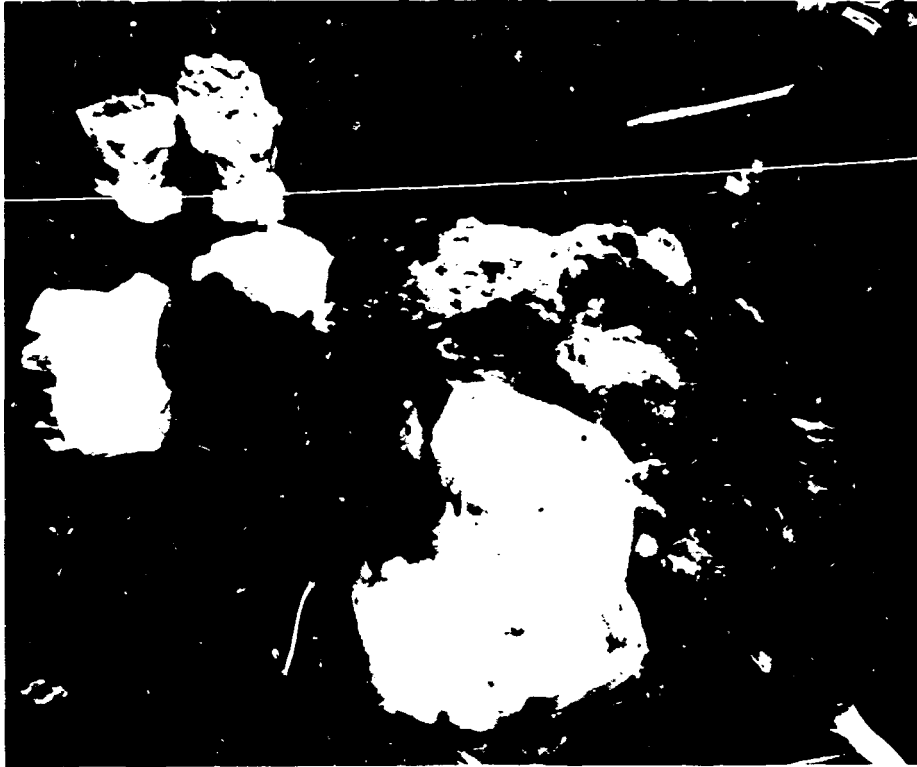
CRABS IN TRADITIONAL PACKS



FISH SAIL WITHOUT PROTECTION
BY USE OF ICE - WHOLESALE MARKET



FLOWERS ON DISPLAY - PROSPECT FOR EXPORT



FLOWER PACKAGING - IMPROVISED BY COMBINING TWO CARTONS



EMPTY CONTAINERS IN A TRUCK

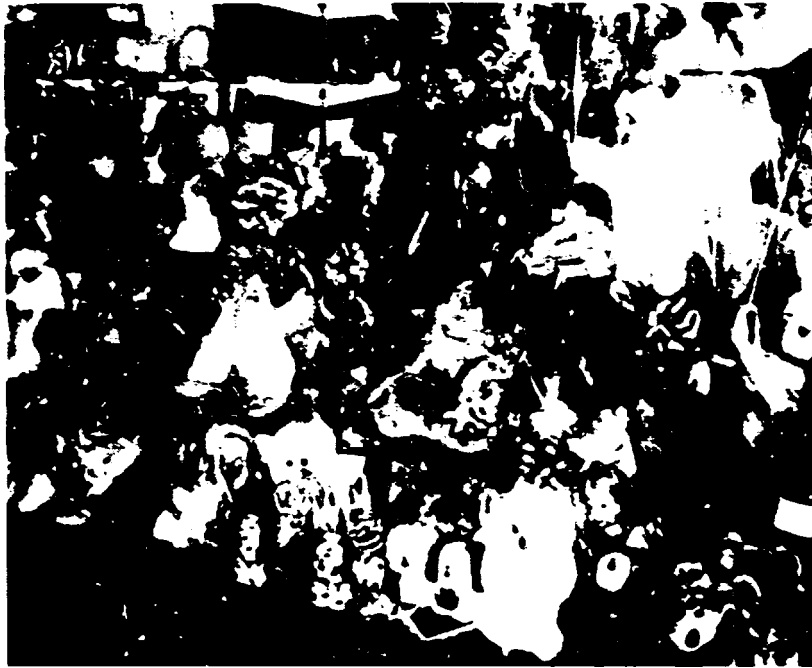


PREPONDERANCE OF TIN PACKAGING

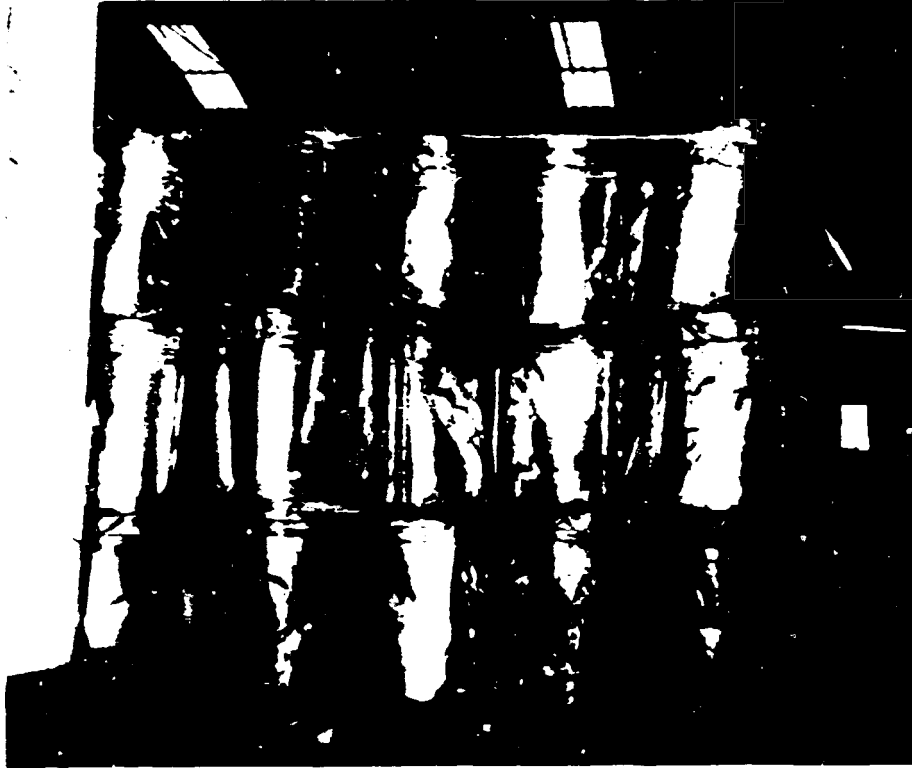


USE OF EXCESS MATERIAL

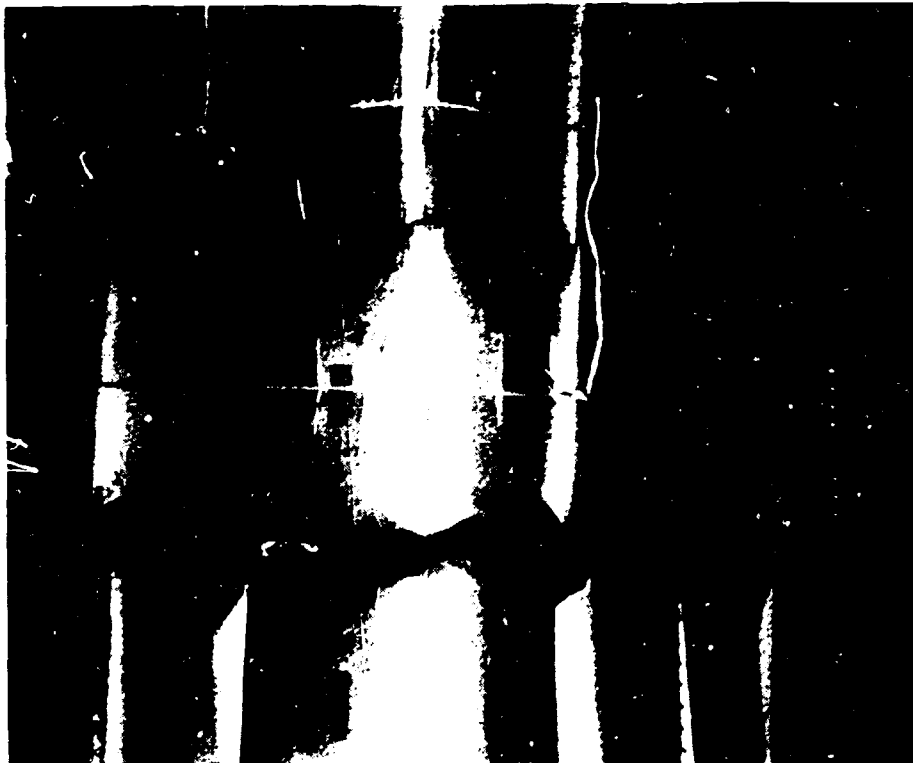
IN PACKAGING



FAULTY HANDLING - CHEMICALS IN
METAL DRUMS



BULGING CARTONS - WEAK COMPRESSION
STRENGTH



SALE OF CHICKEN UNDER AMBIENT
CONDITIONS



8.0 Promotion of standards.- A strategic approach:

8.1 Packaging development in Mexico, particularly for the processed food and consumer goods, have broadly followed the trends obtaining in USA. Very little research has been carried out with regard to indigenous materials and modifications needed in them to suit the changing conditions. With the exception of wood and glass the production technology is an adopted technology and many of the specifications have remained static in nature. Even in the case of glass containers and bottles the standardisation leading to variety reduction and its concomitant effects on industrial costs have also not been well considered.

Sufficient progress has been made in end product standardisation but the field of packaging material and subsequently the converted packages, with a few notable exceptions are still short of such features of ensuring uniform quality, acceptable trade specifications and cost effective packages.

8.2 The packaging industry more particularly its constituents viz- The manufacturers of paper sacks, corrugated fibre board boxes duplex board cartons, polyethylene films and bags, plastic jars and bottles, plastic sacks seem to operate under stress. In an inflation affected economy and rising costs of living they are not able to transfer the incidence of rising costs to the package users due relatively to weaker bargaining strength. Accordingly, for survival and sustenance they tend to cut the corners by using material specifications that can sustain them in business. The compliance of desirable quality standards and specifications, broadly speaking, is declining in importance.

- 8.3 A number of voluntary and statutory standards in respect of packaging materials, packages and components exist in the country. No attempt seems to have been made to judge the extent to which these standards particularly the voluntary ones are being followed by those for whom these are intended. The success of standardization requires de-facto Commitment On the part of the packaging industry, the user industries to implement these within available resources. Without such a commitment, these remain to be an academic proposition of the standard's formulation organization.
- 8.4 It will be highly presumptuous on the part of the consultant to make sweeping statements about the success or failure of standardization in packaging. An in depth study to assess it is called for. However the impressions gathered from some of the members of the packaging industry and those engaged in the formulation of standards, are indicative that the industry's attitude is typically luke warm to their adoption if not totally indifferent. This is further supported by the fact that many of the converting and package user industries are not well equipped with testing instrument and equipment to assess objectively the specifications and standards of the packaging materials and packages, nor do they seek any assistance from LANFI, where such facilities for testing exist.
- 8.5 Experiences in a number of countries provide evidence that standards of the industry, by the industry and for the industry and its users have achieved a remarkable success in implementation vis-a vis those which are formulated for the industry by a body/organization whom the industry perceives it external to it's interest. The formulation agency, at best could be a catalytic agent and work as a secretariat to integrate various interests, but under no circumstances, should assume the Role of an originator

of standards seeking ratification by the industry
The co-ordinating Agency 'LANFI'S' various subgroups on
standardization including representative of DGN may have
to place themselves in different roles-in collecting
and collating data, presenting background material, taking
~~minutes on discussions~~, soliciting comments and afterwards
preparing a draft standard for circulation. It is sug-
gested that the project selection for standardization
should originate from the industry's representatives-
trade associations and sub-committees should be chaired
by the representatives of the industries.

8.6 The user industries do not insist upon the supply of ma-
terials strictly according to the specifications. Neither
they have the expertise and equipment to test the specifi-
cations. There appears to be a lack of appreciation to
test these specifications. Proper education of the user
industries on the merits of right and adequate material, it
is hoped, can greatly benefit the implementation process.

8.7 Suggestions

Mexican packaging association, and the associations of
packaging material manufacturers, should be encouraged to
take up the exercise of formulation of trade standard/code
of practices for compliance by members. These after due expe-
rimentation can be taken up for formulation of National Stand-
ards.

8.8 LANFI may conduct programmes/seminars for the benefit of ma-
terial purchase managers of various package user industries
more particular on subjects-cost effectiveness of packaging,
quality assessment and maintenance, of packaging material; pa-
ckaging standards and specifications, testing and evaluation.

8.9 Both the package user and the material converting industries,
must be constantly made aware of the need to bring about a
qualitative shift in their operations. LANFI's participation

in industrial exhibitions, instituting awards for recognition of excellence in packaging, organising discussions on T.V. on aspects of product's safety and packaging in the distribution system, needed.

Periodic supplements in the newspapers, economic dailies may be helpful in creating packaging awareness among consumers.

- 9.0 Instances abound where the size of the package is disproportionate to contents causing an exaggerated and misleading impression as to the quantity contained in the package. Many of these large packages are not justified on technical grounds of machineability and protection of the product. A proper orientation of package user industries is recommended both in the interest of optimum use of resources and consumer protection.
- 9.1 In technical schools and institutes of learning, package curriculum of an orientation nature at the appropriate level should be introduced. Technically trained packaging technologists are hard to find in the industry. By and large, make shift arrangements to fill these positions are being made in the user industries. This shortage of technical manpower needs to be bridged by commencing industry based programmes eg packaging for processed food, pharmaceutical industry, consumer goods industries, fresh vegetables and fruits etc.
- 9.2 Packaging for exports, require a much greater attention than accorded hitherto. The recommendations developed must be convincingly demonstrated to the exporters. It is equally important that due emphasis should be given on the method of filling, closing, marking, labelling and handling of the packages in these demonstrations. LANFI'S technical Staff, it is suggested, may hold such demonstration programmes at the premises of the exporters.

10.0 INSPECTION AND CERTIFICATION

- 10.1 It is extremely important that the available supplies of packaging materials and packages bear a seal of quality and conform to the standards prescribed. The aspects of certification with proper emphasis may bring about a technical and technological uplift in the packaging field and promote a better level of confidence between the suppliers and users.
- 10.2 LANFI's competence and knowledge, equipment and facilities, are sufficient to be accorded the status of an accredited laboratory for certification of packaging material and packages according to pre-defined/formulated specifications.
- 10.3 Pre-shipment inspection and certification for exports require a special emphasis and treatment at the exporter's premises. A centralised agency specially authorised for the purpose may have to evolve an integrated system of inspection and quality control for products and packages according to clearly defined and laid down procedures. This agency, may enlist the support of other accredited laboratories. For packages, the certification work on behalf of the proposed agency may be taken up by LANFI.
- 10.4 A scheme of self appraisal and certification that the supplies conform to Mexican Standard..... may be a good beginning to follow.
- 10.5 For mandatory standards, DGN is already having a system for product inspection on the basis of samples drawn at

the point of production. It is advisable to supplement it with samples drawn from the market and assess product's attributes after it had faced distributional hazards.

11.0 FEED BACK INFORMATION

11.1 Information on success and failure ratios of certified packages in the distribution system should be periodically collected and evaluated to assess the suitability or otherwise of the standard and specifications formulated. For export shipments, an analysis of the insurance claims preferred on account of incidences of damage suffered during transit could be valuable data to refer to. Assistance can be solicited from packaging institutes functioning in the export markets and get some sample shipments evaluated on arrival in the destination markets.

11.2 Particularly, for packaged food and pharmaceutical products, consumers should be informed to forward defective products to DGN for analysis and evaluation, who in turn should take up the matter with the concerned manufacturers.

11.3 The responsibility for deploying the appropriate packaging material/packages should exclusively rest with the package users, who should be made accountable for any failure/s reported on these.

11.4 Information Labeling

The tendency to protect the consumer against the abuse of exploitation, has lead many countries to standardise the information components on labels on various products particularly in the case of food and pharmaceutical industries. In certain countries, their standards have been made mandatory and reduced to acts. Where necessary penalties for violations have been prescribed. DGN is in the process of bringing about a packaged commodity act which may also include display of information on weights and measures, date of packing, expiry date (if applicable) and contents

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-for food, edible and other hazardous goods - and notes
of caution.

- 12.0 **PACKAGING MACHINERY** - It's feasibility of manufacture in México.
- 12.1 Packaging is an all embracing function involving material selection, conversion, forming, filling and closing of the filled packages and their distribution. To achieve functional efficiency of domestically produced packaging material, it is important to have appropriate packaging technology - machinery and systems.
- 12.2 On technological front, foreign countries provide 80 percent of this technology used by the Mexican Industries. Of this total foreign technology, 52 percent comes from USA, 4 percent from Germany, 3 percent from France and 3 percent from Great Britain, 2 percent from Switzerland, 2 percent from Japan, 34 percent from 35 other countries. According to CANACINTRA, 25 percent of technology from foreign countries, goes towards intermediate goods, 13 percent for Capital goods, 10 percent for durable goods, 9.6 percent for non durable goods, 5 percent for agro-industry, 1.5 percent for strategic inputs and 34.2 percent for products considered non essential.
- 12.3 No data could be obtained on the types and number of packaging machines and systems manufactured with technical know-how and or indigeneous technology in the country. It is important to have this information collected together with capacities available, status of technology, the customer groups and the past rate of growth and future forecast of demand.

12.4 The basic infrastructure of the engineering industry in Mexico, it is understood, is adequate to manufacture semi-automatic, medium speed packaging machines and systems - more suitable to meet the requirements of the small and medium scale industries. In the analysis that follows an attempt has been made to identify areas of relevance where further work is to be done.

12.5 Packaging machinery industry is divided into four major segments.

- a. Containers of component making machinery
 - (i) Paper container, board and box and component making machinery.
 - (ii) Plastic container, film and component making machinery.
 - (iii) Metal container and component making machinery.
 - (iv) Coating, impregnating and laminating machinery
 - (v) Printing and allied machinery.
- b. Forming, filling and sealing machinery for packaging of liquids and solids.
- c. Package testing equipment for material and packages.
- d. Material handling equipment.

A. Paper container and component making and related machinery.

12.6 Mexican paper and pulp industry is on the way to recovery. The optimism displayed by the National Chamber of paper and pulp industries augurs well and forecasts a much higher production for all varieties of paper including the packaging paper.

12.7 The corrugated board and box making industry may expect a further rise in demand for their products once the recovery phase in the food and pharmaceutical, domestic appliances, cigarettes, cosmetic, electrical, and electronic, industries sets in motion. Already the production performance witnessed in the first four months of the current year, confirm the view that economy has begun to move in the desired direction.

12.8 No firm estimates of demand for corrugated board and box making machinery are available. However, it is considered judicious to look into the possibilities of manufacturing semi-automatic plants with a capacity of 50 to 60 tonnes per month.

The product mix of the industry consists of:

- (i) Corrugating machines - single and double face.

- (ii) Rotary - creasing - cutting and slotting machines
- (iii) Sheet/board cutting machines hand or power operated.
- (iv) Partition machines.
- (v) Pasting machines.
- (vi) Stitching machines.
- (vii) Punching machines.
- (viii) Scoring, creasing and cutting machines.
- (ix) Printing machines.

B. Plastic container, film and component making machinery.

12.9 The country is endowed with a well developed petro-chemical industry and produces polyethylene, polystyrene, pvc and other plastic materials.

It is envisaged that the decade of eighties will witness an enormous use of plastic material in packaging. Already bulk of LDPE produced in the country is converted into films, for bags, wrappers, carrier bags, sacks, shrink film, and stretch and cling wrap films. In respect of HDPE, bottles and containers account for the largest share of the

polymer followed by films, crates and pails.

Other plastic materials in use in packaging are polyvinyl chloride, polystyrene, polypropylene representing a varied range of products - closures, shrink and stretch films, bottles, thermoformed containers, straps, nets, sacks etc.

12.10

The capacity of the converting industry may have to be stepped up many folds as more and more products are packed in plastic films, bottles, jerry cans drums ...etc.

The possibility of new manufactures to commence small scale operation and join the existing converters is considered to be very bright.

Moreover, the existing units are understood to be working at an efficiency level of 85-90% and may have to add new equipment for expansion of their respective capacities. The product mix of plastic converting machinery consists of:

- (i) Film extruding equipment.
- (ii) Injection moulding machines.
- (iii) Blow moulding machines.
- (iv) Sealing machines - impulse for making bags and pouches
- (v) Laminating machines.

- (vi) Welding machines - high frequency
- (vii) Bag filling and closing machines (infra-red, heat pulse controlled) for polyethylene film bags and pouches.
- (viii) Printing machines for printing of bottles, films, bags, laminated rolls etc.
- (ix) Wrapping machines - stretch, cling and shrink films.
- (x) Sack manufacturing plants.

Manufacture of injection moulding machines, sealing machines - impulse, rotogravure, flexographic and screen printing machines, shrink film wrapping machines, blow moulding machines - are the prospects for undertaking their manufacture in the country.

12.11

Coating, impregnating and laminating and related machinery.

Low density polyethylene coated paper and board, wax coated paper board, LDPE coated high density polyethylene woven fabrics, adhesive coating on paper and pvc; bitumen coating on kraft paper and henequene fabric; paper and board varnishing, heat and adhesive lamination of composite material like paper, LDPE and foil, paper LDPE and metallised film are few of the packaging material used in converted form in the package users industries in Mexico.

Coating, impregnating and laminating machinery manufactured in India and Taiwan, bear enough testimony to the fact that these machines can preferably be produced within Mexico and in the opinion of the consultant are very much within the manufacturing abilities of the Mexican engineering industries.

12.12 Wax coating machines for reel to reel coating on paper and with a speed of 100 to 150 meters per minute and having a provision for variable speed, with unwinding-rewinding and web control and with slitting attachment, are simple machines. Water repellent paper is widely required in a number of application areas in packaging. The manufacture of these machines after due assessment of the demand is recommended.

D. Printing and Allied Machinery.

12.13 Printing and allied machinery is an integral part of the packaging industry. Almost every segment of the converted material is printed/marked in some form or other. Information labelling, printing of instructions for food and pharmaceutical and hazardous products are mandatory. In other cases, marketing and brand identification requirements to present the products in highly attractive and appealing form have made the need for printed packages almost a necessity.

12.14

Printing and allied machines needed in the packaging industry can be classified as:

- (i) Offset - printing machines
- (ii) Rotogravure printing machines - two multicolored
- (iii) Flexographic machines - two single and multicolored
- (iv) Letter press machines
- (v) Web offset printing machines
- (vi) Screen printing machines

A wide variety of flexible printing materials like cellophane, polypropylene, LDPE, HDPE, PVC high density polyethylene high molecular films, laminated composite material and paper and board in reel forms -require continuous printing in 2 - .5 colours. Rotogravure printing machinery is depolyed for the purpose both for achieving advantages of sharpness of printing and economies of scale. For smaller runs , and when piece/sheet printing is called for it is advantageous to use flexographic printing machinery.

Rotogravure and flexographic printing machines are simple to fabricate and their manufacture is recommended to be undertaken in Mexico.

12.15 Package Testing Equipment.

Some of simple types of testing equipment particularly for testing of materials like paper, plastics, bottles, jerrycans, drums, printed material etc. can be manufactured and made available to the package manufacturer and user industries. with increasing awareness and desire to maintain quality, the demand for such equipment is expected to rise . Equipments like:

- Bursting strength tester
- Gloss/reflective meter
- Impact tear tester
- Moisture meter
- Polariscopes
- Puncture resistance tester
- Seam checking micrometer
- Tensile strength tester
- Tear strength tester

are recommended for manufacture.

E. HANDLING EQUIPMENT

- 12.16 Safety, speed and economy in package handling is dependent upon the type and handling equipment and operation skills deployed. To achieve productivity in handling operation and also to use human resources, optimum man-machine combination is important. A variety of handling equipment are being used in the Country. Simple ones are already being manufactured. EQUIPMENT like electrical winches hand operated hydraulic lift trucks, conveyor belts, EOT cranes, ramps, mobile cranes, etc., may have to be looked into further for manufacturing within the Country. Attention is invited to British Standards Institution code 1133 on handling equipment.

13.0

INTEGRATED PLAN FOR FORMULATION
OF PACKAGING STANDARDS.

The Mexican packaging industry needs to be developed on a planned basis and requires a great deal of encouragement from the Government in order to play its role effectively in the distribution system in Mexico - and help promote exports in the destination markets abroad. This industry's various partners viz basic material manufacturers, converters, the package - users, the technical and technological institute have not yet directed their full energies to packaging research and development, process economies, innovations and modifications to create a sound infrastructural base for the industry. The emphasis had mainly been on deriving sustenance and growth on the basis of technologies and processes developed abroad - mainly by transnational companies in the UNITED STATES OF AMERICA.

The need for progressive indigenisation of the industry in the use of material and processes is likely to result in short run, in unleashing pressures and strains on the current production mechanism. One can expect to encounter opinions directed at the devaluation of the indigenous material, national processes vis-a - vis based on imports.

Already such concerns are being voiced by a segment of the industry.

13.2

The domestic industry can overcome such a shortcoming by continuously improving the quality of its production, seeking knowledge and know-how from certain selected quarters relevant to its immediate needs.

It must be recognised that the industry's unique feature lies in its diversity - with each segment playing a limited role in the sphere of its application while the sum total of all the segments make it a sizeable entity. On account of this diversity, there is a need to coordinate the growth of this industry to be coordinated by a special development committee. This need is best appreciated in view of the component sectors of the packaging industry that belong to other fields of specialisation. For instance, tin plate is an integral part of steel industry, plastic that of chemical, glass that of chemical, wood that of forestry, paper converting that of paper industry, jute/henequene of textile etc. etc. In the development committee, the different involvements may work together to coordinate activities taking place elsewhere.

13.3

INTEGRATED PLAN FOR STANDARDISATION .

The life line of an integrated plan for standardisation is the existence of right packaging consciousness amongst the user industries, packaging material producers , packaging machinery manufacturers,

research and development organisations, shipping and transport companies. This right consciousness, it is felt, does not exist to the desired level. LANFi, a scientific resource among other things, may have to create the right packaging consciousness by bringing to the notice of all concerned the developments - achieved in the field and the future course of action needed to serve the national interests.

13.4

The priority of packaging standardisation work may have to be addressed to areas that have a great influence on the well being of the common man and the items meant for exports. In the analysis, presented in the earlier chapters, some selected items have been identified as suggestion for future work.

13.5

A great deal of work particularly for the standardisation of packaging materials, components and testing have been done by the standardisation organisations/associations in many advanced countries and developing countries.

The information contained in these can be a good - starting point for the standardisation work. It is extremely important to avoid the temptation of copying these and branding them as the national standards.

The international standards and recommendations

made there in, may have to be reviewed and modified for their observance in the domestic situation, although their observance for international trade is an essential obligation.

Empirical evidence in many countries, where the standardisation has achieved remarkable success, is suggestive of the fact, that the coordinating and or formulating agencies must aim at getting the maximum involvement of all related private and public bodies and must not be in an undue haste to complete the drafts without collecting data from various organisations.

A suggested approach is graphically presented in appendix 5.

13.6

Plastic films and containers for food and consumer goods may achieve a much better share of the market in days to come. It is important that certain material based standards may be formulated, keeping in view the plasticiser, colorants and other additives available in the country. It is also to be borne in mind that many of these bottles and containers are not for one time use. Containers are observed to have secondary and even tertiary uses. For instance, plastic bottles used for shampoo, liquid cosmetics, fruit juices are reused in the households for a number of other uses to contain edible and non edible products. It is important to protect the consumer against the

toxic/harmful effects in reuse operation. It should be obligatory to PRINT SYMBOL OF "POISON" on a bottle of insecticide rather than putting a label on it-which may get removed in multiple uses.

13.7

It is recommended that the following material based standards may be formulated.

1. Plastic films Quality standards for general use and wrapping of foodstuffs.
2. Plastic coated Standard in capacity and shelf life
paper board avoidance of odour.
and cartons (Refer ASTM 6459 and BS 3755)
for milk and
fruit juices.
3. Plastic Performance requirements (Ref. BS
bottles 4839 part I, II and III)
4. Films Test for water vapour transmission
rate.
(Ref. ASTM E 96-66-1974)
Code of practice for outdoor
weathering of plastics (Ref. ASTM
1435-1979)
5. Paper Test for printing ink permeation on
paper and board(Ref.ASTM D 80-1979)
6. Closures Water vapour transmission through screw
cap closures liners (Ref.ASTM D 3199-79)
7. Wooden cases Wooden cases for tobacco for exports.
(Ref. Indian Std.8358-1977) Timber
species suitable for wooden packaging
(Ref. IS 6662-1980).
8. Pallets non- (Ref. IS 7276-1979)
expendable
Recommendations
for handling of (Ref. IS 8006-1976)
wooden pallets.

14.0 CONCLUSIONS AND RECOMMENDATIONS

	<u>PRIORITY</u>	<u>RECOMMENDATIONS</u>
1.	I	National level efforts and strategies should be initiated to promote the acceptance and implementation of packaging standards for food and pharmaceutical products. Enlisting support of the trade associations, transport carriers, and associations of package user industries could prove to be very effective in this context.
2.	I	Technical staff in the packaging and end user industries should be trained on aspects of quality standards, their monitoring through testing and improvement. The material managers are seldom aware of the specifications of the materials they procure much less of their assessment. It is important that the industrial enterprises procure necessary testing equipment for ensuring in process quality control of the products produced. LANFI's testing services on materials and packages should be brought to the notice of the industries concerned.
3.	I	Formulation of standards of packaging for food and pharmaceutical products and basic consumers goods needed by the common man should be given the highest priority. A selected list of these products with the type of packaging material/packages needed have been identified for further work on the subject.

4. I Packaging for exports deserves a much greater prominence and treatment. Guidelines for packaging of fresh fruits and vegetables were issued by D.G.N. in 1982. Feed back data on the suitability or otherwise of the recommendations made is lacking. It is important to have performance data on the behavior of these packages in the field and take corrective actions to bridge the gaps. Efforts should be made to incorporate the material specifications, already available, with LANFI in the guidelines issued by D.G.N. These deserve a fair trial, as a fore-runner to formulations of standards of packaging.
5. I Oversized packages disproportionate to the quantity or volume of the contents appears to be a strong tradition and trade practice. Not only it is uneconomical and promote non judicious use of packaging material, but is deceptive packaging to harm the interests of consumers. Oversized packages for dolls, toys, powdered detergents, cake mixes, noodles, etc., are some of the illustrations under reference. An orientation of the package user industries to observe business ethics in avoiding the practice of deceptive packaging is recommended. National Chamber of Commerce (CANACINTRA) could be an effective source to tap.
6. I To achieve functional efficiency of domestically produced packaging material, it is essential to have appropriate packaging machinery and systems. No basic data exists on the status of the packaging machinery manufacturing industry in the Country. A status survey of the packaging machinery manufacu

turing industry together with the preparation of forecasts of demand for various types of machinery and equipment needed-should be undertaken. LANFI, in cooperation with the National Chamber of Manufacturers may undertake the survey. Detailed list of manufacturing facilities in existence, facilities needed, identification of technological gaps, infrastructure of technical skills, capacities available and utilised, etc., may be highlighted.

7. I A strong case exists for upgrading the quality of liners used in the manufacture of corrugated board and boxes. Currently used liner is much inferior in quality and fails to provide the necessary compression strength needed in the corrugated boxes. Constructional modifications are needed to remedy the situation in the short run. Guidelines for manufacturing other types of C.F. boxes may be prepared and brought to the notice of the user industries.
8. I Improvements in methods of filling, closing, handling storage of boxes&containers are urgently called for loss prone products like fresh fruits and vegetables. It is important that the wrapper used should permit the fruits to breathe and not cause accelerated maturity.

Substantial reduction in product losses such as crushed tomatoes soft mangoes, over ripe plums, peaches,bruised apples, papaya, etc., can be achieved by proper filling, closing, handling and storage of packages.

9. I Preshipment inspection and certification for products and packages meant for exports is expected to be beneficial in the long run. Such inspection by a central body should be considered. LANFI can assist this body in carrying out the certification of packages.
10. I A number of countries have formulated package commodity regulations to protect the interests of consumers. Particularly, in respect of pre-packed food, pharmaceutical and hazardous products, packaging requirements are clearly specified. Compliance by the package users is a must. For products prone to spoilage, date of packaging and expiry are essentially to be mentioned at a prominent place on the label. There is a need to formulate such mandatory standards.
11. I The use of plastics in the food industry is on the increase. The resin portion of plastic material is usually resistant to bacteria. It is generally plasticize , lubricants, stabilisers and colorants that are responsible for bacterial attack on plastic materials. It is important to establish standard tests for establishing resistance of plastics to microbiological attack-under conditions of high temperature and humidity. This needs to be developed.
12. I Glass bottles containing processed food, carbonated beverages, non carbonated liquid drinks, alcoholic drinks, powdered products are fragile and susceptible to breakage in transportation, handling and

storage. The product losses in the distribution system are high and need to be checked. Standard on transportation, handling, storage of glass bottles should be developed.

13. I All the international standards and codes such as I.A.T.A. regulations for packages meant for Air Freight, International Maritime Dangerous goods code, International regulations concerning the carriage of dangerous goods by rail; European Agreement concerning the carriage of dangerous goods by road - American Society for Testing of Materials - standards, need to be looked into for formulation of standards for packaging and movement of hazardous goods. LANFI is already on the job. Discussions with the representative of Mexican railways revealed that many of the markers don't understand international codes and practices for marking. It is recommended that Nationally Understood Symbols may be introduced for proper communication and instructions
14. I Package suppliers may be advised to have a self appraisal scheme and certify their packages by issuance of certificates that these materials conform to NOM-EE..... standards (where ever their standards exist). Over a period of time, such a step would promote the confidence of the users in their suppliers and also make it easier for them to get the specifications tested as and when required.
15. 2 Standards for packing and marking meant for exports should be documented in a manner as to be understood by the monitoring agency.

16. 2 Marking for handling instructions on packages though formulated into a standard need to be reviewed in terms of symbols that are well understood by the workers and supervisors engaged in the handling operations.

For instance the symbol to be kept away from cold is not well understood by the workers.

17. I "Metal Can" manufacturers should be advised to certify that the quality of cans supplied to the food processing industry, is safe for the intended use and conforms to NOM-EE-11-S. It is learnt that there are wide variations in the quality of cans particularly "tin cans" supplied to the food industry.

18. I DGN's officials carry out sample inspection and testing of food by sampling products from the respective factories. No tests on the adequacy and suitability of the packaging material are being performed. There is a need to do the same. It is recommended to supplement the inspection by having samples from the market and testing the product to confirm the suitability of food. It is felt that such an inspection would be more relevant after the products had faced the hazards of distribution.

19. I Packaging is a highly diversified field having frontiers with all production and distribution activities in the Country. It is advisable to

have a national plan for packaging materials and create a forum like a development Council for the packaging industry with representation from various Economic Ministries, Chambers of Commerce, Consumer Concils, etc.

20. 2 Project selection for standardisation should preferably originate from the industry, consumer protection organisation, user industries, health organisations, transport and handling bodies, etc., rather than from LANFI. In the various Sub-Committees on standardisation of LANFI, a greater representation from the industry and consumers is needed. It is preferable to get the various Sub-Committees chaired by the members from the industry.
21. 2 Packaging curriculum may be introduced in this technical educational institutions. Students of today are managers of tomorrow - the impressions formed during student life are more lasting. In future work situations, they may be in a position to have better appreciation.
22. 2 Certain packaging machines and systems have been identified for their manufacture within the Country. After proper assessment of the demand, it is recommended to encourage the manufacture of the machines within the Country. For instance, manufacture of impulse sealers, shrink tunnels, corrugated board and box making machines, blow moulding machines, printing-rotogravure and flexographic two-four colour machines - can be a good starting point.

23. I Mexican railways are experiencing a great deal of difficulty in handling of general cargo, fresh vegetables and fruits. One of the causes attributable to this malady is the practice of improper closure of container, sacks. Railways may develop a general code for acceptance of cargo. Cargo not conforming to this code may be accepted at OWNER'S RISK.
24. 2 LANFI's staff needs a deeper understanding of the technology of production and use of packaging material. Closer contacts with the industry and orientation for a period of 7 to 10 days in different packaging material production industries is recommended.
25. 2 In joint collaboration with the consumer protection Council, LANFI may organise programmes on CONSUMER PROTECTION AND PACKAGING in different parts of Mexico. The Council has expressed its willingness to collaborate in their programmess.



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

UNIDO

24 February 1984

PROJECT IN THE UNITED MEXICAN STATES

INTERNAL

JOB DESCRIPTION

DP|MEX|82|010|11-55|31.7.E

Post title	Consultant in Package Standardization
Duration	One and a half months
Date required	As soon as possible
Duty station	Mexico City, with travel within the country
Purpose of project	To assist the Government in the definition of a national packaging consumption and manufacture policy, in the elaboration of integrated guidelines, regulations and incentives for the development of the packaging manufacturer industries according to the main national needs and priorities and in the rationalization of the packaging machinery utilized in the country for economic planning purposes.
Duties	<p>The consultant will be assigned to <u>SECOFIN</u> (Ministry of Commerce and Industrial Promotion) and will report to the Director General of Food and Consumer Goods Industries or the delegates thereof if so determined and be introduced to the national counterparts for the mission. The consultant will specifically be expected to :</p> <ol style="list-style-type: none">1. Get acquainted with the existing study on the short and medium term forecast for the consumption of packaging in the country, as well as with the reports of former experts who have recently carried out missions related to the technical field of the present one;2. Get acquainted with the main principles and priorities of the Government's economic policy and analyse their influence or effect on the utilization and manufacture of packages and packaging machinery in the country;3. Get acquainted with the packaging or packaging related standards already issued or under preparation in the country, as well as with the structure and functioning of the national standards institution (Dirección General de Normas);

.... / ..

Applications and communications regarding this Job Description should be sent to:

Project Personnel Recruitment Section, Industrial Operations Division
UNIDO, VIENNA INTERNATIONAL CENTRE, P.O. Box 300, Vienna, Austria

4. Elaborate an integrated plan of the packaging standards which should be prepared and issued in the country at short and medium term, according to the priority needs of the country in terms of packaging standardization and the economic policy of the Government;
5. Select the international standards or national standards from experienced countries which could be translated, discussed and adapted for the preparation of the standards proposed in the plan referred to above;
6. Propose, discuss and elaborate a list of prototypes for basic packaging machines which could be recommended for the standardized packaging of main food and consumer goods. for their subsequent study regarding possibilities and the suitability for production in the country due to ease of manufacture, operation and repair, large quantities required and specific suitability to the national prevailing conditions;
7. Give ad hoc advice on matters within the technical field of the mission whenever specifically requested by the national counterparts.

The consultant will also be expected to prepare a final report setting out the findings of the mission and recommendations to the Government on further action which might be taken.

Qualifications

Packaging Technologist with a University Degree or equivalent experience and specific capacity with regard to standardization and industrial planning.

Language

English (Spanish an asset)

Background Information

The on-going project "Research and Development in Food Processing and Packaging Technology" was submitted for a thorough revision in the light of the related priorities within the present Government programme, namely :

- a. effective substitution of imports
- b. elimination of non-indispensable imports
- c. consolidation of an export industrial capacity
- d. development of technology in the priority sectors
- e. rationalization of the production activity.

DEVELOPMENT OBJECTIVES.

The long term objective of the project consists of a balanced development of the country's packaging producing industries in such a form to satisfy to the greatest extent, the national packaging needs utilising local manufacture from indigenous raw materials and resources.

The packaging user industries should make the maximum use of locally made packaging according to standards and specifications which must be adequately developed and take account of the characteristics of the products, the requirements of the envisaged markets and the distribution factors from production to consumption.

Immediate objectives:

- 1). Elaboration of a national packaging policy, aimed at the greatest reduction in imported packages and materials for their manufacture.
- 2). Elaboration of an integrated plan to guide development in the national packaging manufacturing industries.
- 3). Rationalisation of the use of packaging materials, production inputs and packaging machinery.
- 4). Rationalisation of the use of packaging machinery so as to consolidate the volume of specific types of machines and justifying the total or partial manufacture of such machinery in México.

Discussion of Objectives with reference to the Consultants tasks.

1. At the present time the National Policy on Packaging is phrased in general terms as will be realised from the long term and immediate objectives stated in the summary. It is recognised that the complete elimination of imported packaging and materials for producing packaging is not only impossible but probably undesirable in some respects and the first task of the consultants will be to examine the existing gaps between the estimated overall needs of Mexico for specific packaging for particular products and the present volume of domestic production from indigenous materials.

The packaging statistics assembled by LANFI since 1980 and the current survey which is expected to be completed by August 1984 at the latest should provide much of the data for this. Such data can then be used to outline the possible options by which the long term objectives can be achieved. These may involve such alternatives as limiting or even prohibiting the use of imported materials for some products which are consumed only in the country:- switching domestic packaging into alternative media :- operating quota systems for suppliers and/or users and etc. SECOFIN should then be able to evaluate these possibilities and formulate a National Policy in specific rather than general terms.

2. Whatever procedure is adopted to achieve the objectives several packaging types, e.g. those based on tinsplate and imported wood pulp will be affected in terms of materials supplies and their usage and the companies concerned will need to take some action to remain viable. In this respect the consultants should examine the situation and suggest ways in which these areas of package production should develop or diversify.

3. There are several ways to increase the use and/or profitability of any packaging type; some typical and more effective ones being:-
a) to improve the production process so that avoidable waste is reduced or even eliminated.... i.e. by better quality control.
b) to use less of the same material to produce packaging of equal or better efficacy.... i.e. by better design of the existing packaging.
c) to upgrade the existing material (and/or process) to extend the possible markets for which it is suited.... e.g. by improving the resistance of paper based packaging to wet conditions, by coatings or other treatments.
and d) to diversify into other areas by using newer materials and/or techniques to enhance the performance of the existing packaging without increasing the cost.

The packaging and other groups at LANFI are equipped to assist in all these areas by short term tests and by medium term studies in particular packages and product sectors.

4. Rationalisation of the use of packaging; particularly that based on materials which will still be required to be imported; will necessitate studying, updating and rapidly introducing Standards for the packaging of specific products. Priority here must be given to goods for export and the proposals already made by LANFI for fruit and vegetable packaging are illustrative of the basis for further work in other areas. (see LANFI study ref)
Cooperation between LANFI, DGN and various industry sectors will be needed here.

5. Where machinery and equipment for packaging manufacture, material conversion

and filling ,closing,collating etc. processes are concerned it is unlikely that much can be done to reduce the requirement to import specific high speed machines for processes such as papermaking printing cutting and creasing etc. but there will be opportunities to manufacture the more widely used and simpler equipments for heatsealing, case closing, shrink and stretch wrapping, taping and strapping ,coding and etc! These are mainly used by the makers for a wide range of products and when the need is sufficient to justify manufacture by Mexican engineering companies it will be worthwhile to provide financial and/or technical encouragement .There may also be some possibilities on the packaging making side for equipments such as produce moulded pulp trays ,plastic thermoforms and the like. Suggestions for such possibilities are also requested from the consultants.

F A Paine 14 Mayo 1984.

FORMULATION OF PACKAGING STANDARDS - SUGGESTED PROGRAMME

(a) PRODUCT BASED PACKAGING STANDARDS.

PRODUCT	CURRENT PACKING MEDIUM/MEDIA	LIKELY PACKAGING MEDIA/MEDIUM IN ORDER OF PREFERENCE	STANDARD TO BE FORMULATED
1. LIQUID MILK	- TETRAPACK / PURE PAK CARTON - GLASS BOTTLES (RETURNABLE) - COEXTRUDED POLYETHYLENE - FILM POUCHES (1 LITRE) CAPACITY	1.- COEXTRUDED POLYETHYLENE FILM POUCHES (1/2 & 1 LT. CAPACITY) HDPE/LDPE 2.- GLASS BOTTLE (RETURNABLE) 3.- HDPE BLOWN BOTTLES AND JERRY CANS 4.- TETRA PACK / PURE PAK CARTONS	COEXTRUDED POLYETHYLENE - FILM POUCHES. (1/2 AND 1 LITRE CAPACITY) (2) HDPEBLOWN BOTTLES JERRY CANS
2.- DRIED MILK	TIN CANS	1.- GLASS BOTTLES 2.- PLASTIC BOTTLES 3.- POLY BAG IN A CARTON/POLY LINED BOARD 4.- LOW DENSITY POLYETHYLENE POUCHES 5.- PAPER/LDPE/FOIL LAM POUCHES. 6.- TIN CANS	1. BAG IN A CARTON 2. LOW DENSITY POLYETHYLENE POUCHES 2. Paper / LDPE FOIL LAMINATED POUCHES

3. INFANT FOOD GLASS JARS	TIN CANS	1. GLASS JARS 2. -POLY BAG IN CARTON 3. POLY LAMINATED HAR- METICALLY SEALED. 4. TIN CANS	PILFER PROOF CLOSURES FOR GLASS JARS BAG IN CARTON
4. EDIBLE OIL	- GLASS BOTTLES - PVC BOTTLES - TIN CANS - MILD STEEL EPOXY COALID	1. PVC BOTTLES 2. HDPE BLOWN CONTAINERS 3. GLASS BOTTLES 4. MILD STEEL EPOXY C. DRUMS FOR BULK	- HDPE BLOWN CONTAINERS - PVC CONTAINERS
5. CONFECTION- NARY CHOCOLATE, COOKIES	- TIN CANS - CARTONS	1. CARTONS 2. POLYETHYLNE RIGID BOXES.	CODE OF PRACTICE FOR PACKING IN CARTONS
6. PRESERVED FRUITS FRUITS, VEGE. PICKLES, SO- UPS.	- TIN CANS - GLASS BOTTLES - TETRA BRICK	1. GLASS BOTTLES 2. TIN CANS. 3. RETOURT POUCHES IN TRIPLE LAM. PAPER/POLY/FOIL	1. PRESERVED FRUITS IN GLASS CONTAINERS TO BE REVISED. 2. FRUITS IN HDPE CONTAINERS 3. IN POLY BAG IN A BOX. RETORT POUCHES TO - PROCESSED.
7. PRESERVED FISH AND SEA FOOD	- TIN CANS (3 PIECE) - GLASS JAR ^c	1. TIN CANS (2 PIECE) 2. GLASS JARS	- PRESERVED FISH IN TIN CANS (TWO PIECES) - PRESERVED FISH IN GLASS JARS.

8. SOFT DRINKS/ CARBONATED BEVERAGES	GLASS BOTTLES ALUMINIUM CANS	1. GLASS BOTTLES (LIGHT WEIGHT) 2. PET BOTTLES (*) (2 LTS. CAPACITY) 3. ALUMINIUM CANS	SOFT DRINKS IN PET BOTTLES	(*) Subject to produc- tion of PET RESIN IN THE COUNTRY
9. BEER	GLASS BOTTLES TIN PLATE CANS (3 piece)	1. GLASS BOTTLES 2. PET BOTTLES (*) 3. TIN PLATE CANS (2 piece)	BEER IN PET BOTTLES	
10. EGGS	PULP TRAYS PACKED IN CORRUGATED FIBRE BOARD BOXES.	1. PULP TRAYS PACKED IN CORRUGATED FIBRE BOARD BOXES. 2. PLASTIC TRAYS (RE- TURNABLE) PACKED IN CORRUGATED FIBRE BOARD.	CODE OF PRACTICE FOR MANUFACTURE OF PULP TRAYS - TWO SIZES. SPECIFICATION OF CORRUGATED FIBRE BOARD BOX FOR EGGS.	
11. BREAD	POLYETHYLENE BAGS WITH OPEN END. CLOSED BY TWIST TYING. POLYPROPYLENE BAGS FOR BREAD WITH OPEN END. CLOSED BY TWIST TYING.	1. POLYPROPYLENE BAGS FOR WRAPPING OF BREAD. 2. POLYPROPYLENE WRAPPERS FOR BREAD.	PACKAGING OF BREAD WRAPPER SPECIFICA- TIONS.	
12. PASTA	CELLOPHANE WRAP WITH GLUED/STAPPLED LABEL CLOSURE.	1. POLYPROPYLENE WRAP WITH HEAT SEALED ENDS.	POLYPROPYLENE LINE WRAP.	

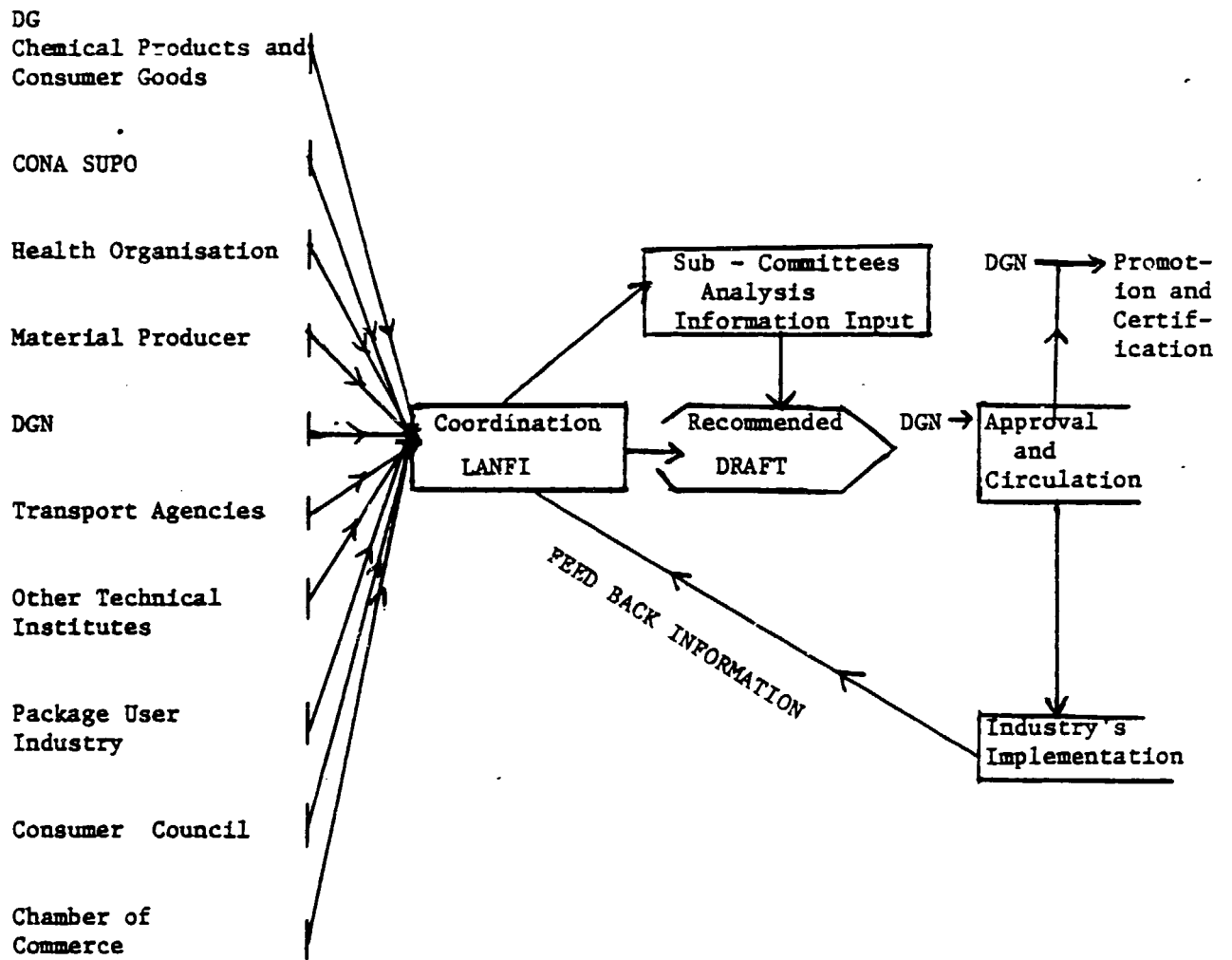
13. COFFEE POWDERED COCOA POWDERED	GLASS BOTTLES TIN CANS	GLASS BOTTLES PAPER/POLY/FOIL OR PAPER/POLY/ METALLISED POLYESTER POUCHES	PAPER/POLY - FOIL POUCHES PAPER/POLY - METALLISED POLYESTER POUCHES
14. H A M	LOOSE WITHOUT ANY PACKAGING FROZEN WITH POLY- ETHYLENE WRAP TIN CANS	FROZEN IN STRETCHABLE FILM THERMOFORMED POLYSTYRENE CONTAINERS	CODE OF PRACTICE FOR THERMOFORMED POLYSTYRENE CON- TAINERS FOR HAM.
15. S A L T	POLYETHYLENE BAGS LOOSE	1. POLYETHYLENE BAGS 2. LOOSE	CODE OF PRACTICE - POLYETHYLENE BAGS FOR SALT.
16. SOAP IN CAKE FORM WASHING	PAPER WRAPPING	WAX COATED PAPER WRAP POLY COATED PAPER WRAP	WRAPPER FOR SOAP CAKES CODE OF PRACTICE
17. RETAILING	PAPER BAGS POLYETHYLENE BAGS	1. HIGH DENSITY HIGH MOLECULAR POLYETHYLENE BAGS 2. POLYETHYLENE BAGS	POLYETHYLENE BAGS FOR GENERAL PURPOSES HIGH DENSITY HIGH MOLECULAR POLYETHYLENE BAGS FOR GENERAL PURPOSES.
18. POWDERED DETERGENT	POLYETHYLENE BAGS FOLDING CARTONS	POLYETHYLENE BAGS FOLDING CARTONS	POLYETHYLENE BAGS FOR DETERGENT.

19. PHARCEUTICAL PRODUCTS	GLASS AMPOULES GLASS VIALS GLASS BOTTLES AL - FOIL AL - COLLAPSIBLE TUBES BLISTER & STRIP PACKS	GLASS AMPOULES GLASS VIALS GLASS BOTTLES AL - FOIL AL - COLLAPSIBLE TUBES BLISTER & STRIP PACKS	PLASTIC CONTAINER FOR PHARMACEUTICAL USE A) PARENTERAL AND OPHTHALMIC PREPARATIONS B) OTHER THAN PARENTERAL AND OPHTHALMIC PREPARATIONS
20. LIQUID INSECTICIDES	METAL WITH AEROSOL DISPENSER GLASS BOTTLES WITH AEROSOL DISPENSER HDPE BOTTLES	1. HDPE BOTTLES 2. GLASS BOTTLES WITH AEROSOL DISPENSER	1. HDPE BOTTLE 2. GLASS BOTTLES WITH AEROSOL DISPENSER
21. COSMETICS LIQUID	GLASS BOTTLES AEROSOL TIN & GLASS CONTAINERS PVC BOTTLES	1. GLASS BOTTLES 2. AEROSOL GLASS CONTAINERS. 3. PVC BOTTLES	AEROSOL PRODUCTS WITH METAL AEROSOL, METHOD OF TEST FOR COMPATIBILITY & INFLAMMABILITY.
22. TOBACCO LEAVES WITH STEMS	HENEQUENE BALES	HENEQUENE BALES WOODEN CRATES WOODEN BOXES	WOOD
23. FRESH VEGETABLES	HENEQUENE SACKS PLASTIC SACKS WOODEN CRATES	HENEQUENE SACKS PLASTIC SACKS WOODEN CRATES	DIMENSIONAL SPECIFICATIONS FOR SACKS FOR VEGETABLES.

24. FRESH FRUITS	WOODEN BOXES ROUND WOOD CRATES WOODEN CRATES BASKETS	WOODEN CRATES WOODEN BOXES ROUND WOOD CRATES BASKETS	CODE OF PRACTICE WOODEN BOXES AND CRATES - Mangos - Apples - Peaches - Pears - Avocado
25. ACID & CHEMI- CALs	LARGE GLASS JARS HDPE BLOWN LARGE CONTAINERS	1. HDPE BLOWN 20 LITERS JERRY CANS 2. LARGE GLASS JARS	HDPE BLOWN 20 LITERS JERRY CANS
26. FERTILISER	POLYETHYLENE LAMMINATED WOVEN SACKS POLYPROPYLENE SACKS	POLYPROPYLENE WOVEN SACKS POLYPROPYLENE SACKS	POLYPROPYLENE WOVEN SACKS
27. CEMENT	MULTIWALLED PAPER SACKS	MULTIWALLED PAPER SACKS	MULTIWALLED PAPER SACKS

FORMULATION OF PACKAGING STANDARDS

Suggested Involvement - as relevant



ORGANISATIONS AND PLACES VISITED

1. CENTRAL DE ABASTO
2. GRAN BAZAR
3. SECOFIN - DIRECTOR GENERAL OF BASIC PRODUCTS
4. HERDEZ - FOOD PROCESSING
5. LABORATORIOS MERCK SHARP AND DOHME.
COMPANY PHARMACEUTICAL LABORATORIES
6. MANUBOL, S.A. - PAPER SALKS
7. PIRAMISA - CALCIUM HYDRO-OXIDE
8. LECHE BOREAL, S.A.
9. K.S. DE MORELOS, S.A. DE C.V.
PLASTIC DIVISION OF BOTTLES
10. NAFINSA - UNIDO - CAPITAL GOODS PROJECT
11. FISH MARKET
12. FLOWER MARKET
13. SUMESA, S.A. DE C.V.
14. DIRECCION GENERAL DE NORMAS - DGN
15. MERCADO DE LA MERCED
16. INSTITUTO NACIONAL DEL CONSUMIDOR
17. LANFI's - STANDARISATION GROUPS.

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