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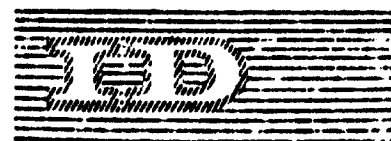
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AFRIFOODS - Regional Consultation on  
Promotional and Technical Aspects of  
Processing and Packaging Foods for Export

Casablanca, Morocco, 23 - 28 June 1974

STANDARDIZATION OF PACKAGING FOODS FOR EXPORT <sup>1/</sup>

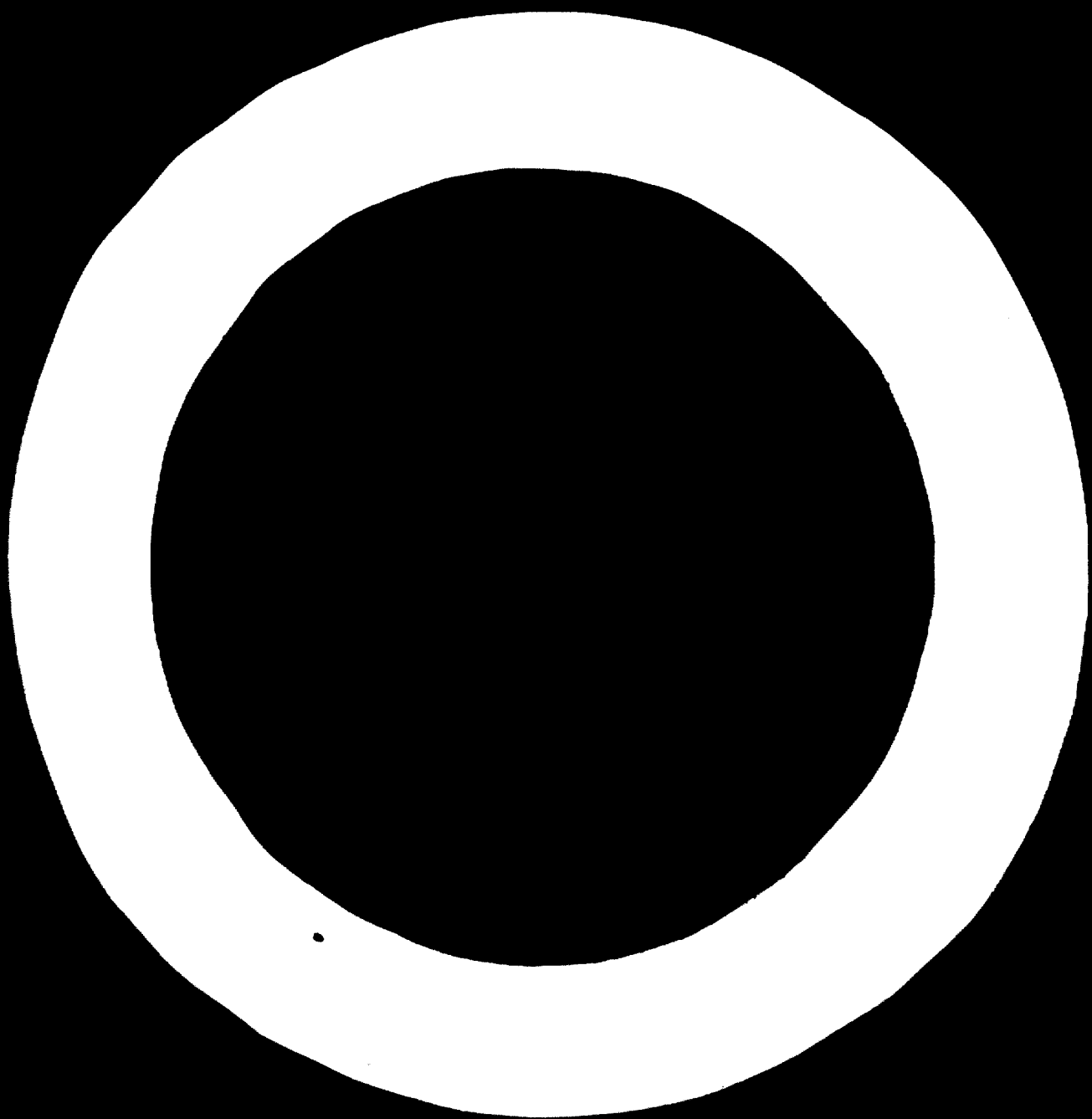
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Standardization of packaging of foodstuffs, whether fresh or processed, has become a vital factor in the concept of modern marketing and distribution.

There is a multiplicity of reasons why standardization is essential which will be dealt with in this paper. It must be stressed at the outset, however, that although the concept is definite, types and dimensions may vary, in the future, as a result of consumer preferences, changing means of transport and the evolution of new packaging materials and methods of storage.

### Marketing

Standardization ensures that the supplier, the distributor and the retailer will have a mutual understanding of the description of the product. They will "speak the same language". Misunderstandings, with possible claims and costly communications, will be reduced to a minimum.

Standardization implies that:

- i) Quality is clearly understood at all levels: Extra Fancy, Fancy Choice, or Class Extra, one, two and three;
- ii) Content by size or weight of each container is also understood;
- iii) The number of units packed into each outer container and the weight and size of the standard outer container are known throughout the chain of distribution.

With this basic information, the distributor:

- i) Co-ordinates the demand from major and minor retail outlets based on regional preferences as to quality and size;
- ii) Ensures that these requirements are clearly transmitted for orderly despatch;
- iii) In so doing, reduces both delivery costs and delays to a minimum.

### Quality

For sophisticated export markets, it is vital that:

- i) Quality should be good and consistent.
- ii) Processing, packing, labelling, transport and distribution costs are the same, regardless of quality. These costs and overheads tend to rise, hence marketing of an inferior product could involve serious losses. With inflation and rising prices, the consumer in general tends to become more selective.
- iii) Competition with many products is severe, given equality of import tariffs.
- iv) With respect to internal and neighbouring markets, similar rigid standards of quality may not apply to these outlets, and general marketing costs should be lower. With a quicker turnover, a quality grade unacceptable in export markets may be readily acceptable internally and offer an adequate return. Given orderly marketing, research into these outlets could be productive and rewarding.

### Unit Pack Sizes:

In the canning industry the range of packs is extremely wide and gives rise to many problems.

- i) Ordering a multiplicity of sizes involves capital investment.
- ii) Space/storage problems occur with the risk of possible deterioration to the cans.
- iii) Seaming machinery costs are increased.
- iv) Various sizes of outer containers have to be ordered and stored.
- v) As a result of iv., the stacking of pallets becomes more complicated.

The examples listed below give some indications of the problems involved.

1. Canned fruit.	<u>Cans per outer</u>	<u>Cubic dimension of outer</u>
	12/2½	.016 cu. metre
	24/1½	.018
	24/20 ounce	.021
	24/16 ounce	.020
	48/11 ounce	.026
	36/12 ounce	.020
	48/8 ounce	.019
	24/15 ounce	.018

2. Canned vegetables.	<u>Cans per outer</u>	<u>Cubic dimension of outer</u>
	24/14 ounce	.017
	12/28 ounce	.014
	48/8 ounce	.029
	24/13 ounce	.015
	24/10 ounce	.014
	12/26 ounce	.013
3. Canned fish.		
Tuna in oil spread	48/7 ounce	.019
	48/1/4s	.010
Senator tuna + savoury tuna	48/6 1/2 ounce	.019
	48/1/4s	.010
King crab	24/1/2s	.011
	24/1/4s	.006
Sardines + tuna fillets	48/1/4s	.011
Prawns/shrimps	24/1/4s	.009
	24/1/4s	.006

The tendency in many markets is to reduce the number of can sizes as well as the size/weight of the outer container, the decisive factors being:

- i) The shortage of sales staff at retail level;
- ii) The preponderance of female staff precludes the handling of heavy weights;
- iii) Space has to be devoted to "fast sellers" to ensure an adequate footage return;
- iv) The pricing of a multiplicity of lines in self service units is time-consuming and costly.

It is in the interest of a processor to reduce his packs to a minimum either by research into the "fast sellers" market, or by granting price concessions as a result of the economies effected. The validity of this policy has been realised by the fresh produce industry, which has eliminated less popular varieties and done away with unwieldy 50 kg containers, adopting standardized 10 and 20 kg cartons. The industry has also withdrawn unpopular sizes (including the very large and very small varieties), and substituted the 10/12 kg carton for the heavy, costly returnable banana box.

### Prepacking

The prepacking of fresh fruits, vegetables, flowers, meat and certain

types of fish - in the case of the latter mostly deep frozen - has developed rapidly and successfully. The advantages are:

- i) Handling in display and service is minimized, thus reducing wastage and service costs;
- ii) Pre-pricing is facilitated;
- iii) The product can be kept in prime condition in cooled and humidified stock rooms and cooled display units.

Experiments have been made with prepacks of canned goods, either providing an assortment or a pack of popular canned products to encourage "impulse buying". Shrink wrapping or a carton can be used for pre-packs of this kind. However, the results are inconclusive, since canned products in themselves are non-perishable, insensitive to handling and can normally be stacked in attractive displays without damage.

#### Unitization

Unitization undoubtedly represents one of the major advances in modern transport. Whereas it is unvariably associated with palletization, unitization can be effected by many methods.

The one-ton load pallet, returnable or non-returnable, with currently accepted dimensions of 100 x 120 and 80 x 120 cm., has been used with success in many fields, especially in the fresh produce industry, where maximum space usage has been achieved with the 100 x 120 cm. pallet.

For other than internal distribution, the returnable pallet has many disadvantages. Cost of return to depots and subsequent assembly and return to the original country of export is costly and involves considerable delays. Even with pallet pools, the same difficulties also arise and documentation is involved. A heavy-duty one-ton pallet is costly and, unless sturdy, wastage is considerable and high repair costs are involved.

The ideal unit is a non-returnable pallet with two-way entry, capable of carrying a one ton load and sufficiently strong to stack five high. A great deal of research is being carried out within the framework of agro-industry into the construction of non-returnable pallets from waste products, such as bagasse (sugar-cane waste) and wood off-cuts, where



timber is available.

In view of present inflationary tendencies, it is difficult to dogmatize; however, it would appear that an expendable one-ton pallet costing between 75 p. and £1 would be a highly advantageous proposition.

It must be stressed that unit dimensions such as 100 x 120 or 80 x 120 cm. are in no way sacred or inflexible. Whereas the dimensions of most fresh produce containers are ideally suited to the 100 x 120 cm. pallet, many packs of canned goods are not and the unit dimensions should be adjusted accordingly.

Another useful method of unitization is offered by the carton, with or without supporting wooden struts, onto which products, such as canned goods, can be loaded without other outer containers. The unit is then bound and handled by push-pull forklift trucks. A similar unit can also be made by replacing the top and sides with moisture-proof shrink-wrap polythene: however, initial experiments have not been satisfactory on account of non-rigidity, which has led to cans being dented and condensation occurring in transit.

Whereas a pallet or unit can be given the necessary rigidity by the proper alternate layer stacking of the cartons or other outer containers used, the gaps resulting on account of dimensional difficulties can usually be filled economically with small polystyrene blocks.

The use of self-adjusting polypropylene binding has greatly improved the rigidity of loads at little expense, overcoming the disadvantages of wire binding which slackened and tight steel binding which often caused injuries upon being cut.

A number of shipping lines provide large five-ton steel pallets onto which the producer pallets can be loaded and the dimensions of which are adjusted to those of the road haulage vehicles effecting onward delivery.

#### Advantages of Unitization:

Loading individual outers at the point of production is a lengthy and

costly operation. However, if palletized a ten-ton load of cartons of apples or 25 kg sacks of potatoes can be handled in about ten minutes as against more than an hour if loaded in single units.

The loading and unloading of vessels with suitable pallet handling equipment is immeasurably faster than traditional stowage. As an example, berthing records from the Port of London Authority show that 180,000 standard cartons of citrus fruit can be discharged from a pallet ship in one-and-one-half days, whereas ten days are needed using traditional stowage methods. Furthermore, it must be appreciated that a chartered vessel can involve demurrage costs of £1,500 per day or more, according to the size and type of vessel.

Multiple handling of individual packages results in damage and losses: this applies not only to fresh produce but to canned and processed products. Heavy claims can be made for dented and damaged cans, apart from any contractual "swell allowance" which may have been agreed upon. Shipments of fresh grapes, packed in 5 kg. trays and palletized, were organized from Almeria, Southern Spain to a depot in Leeds in the northern part of the United Kingdom. The palletized shipments were effected via Bilbao and Liverpool. Of the 17,000 trays shipped, only one tray was damaged. In traditional stowage there can be a loss of up to three per cent in slack and broken packages. With fresh produce, the speed of transit and minimal handling enhance the quality and condition upon arrival at the final destination. The combination of these factors has an important bearing upon the net return for the shipments.

Mention has already been made of the advantages of standardization in the co-ordination of orders from various sources based on regional preferences. If full advantage is taken of unitization, these orders can be prepared before despatch, countermarked and manifested accordingly, and unloaded directly to transport which will proceed to the final point of destination. This method avoids the additional costs of:

1. Sorting
2. Warehousing
3. Re-delivery

These costs are considerable, apart from involving additional handling

with possible damage to the product.

An example of the efficiency of this method is the pallet ship service from the Canary Islands where importers can order pallet loads of the sizes and grades of produce required. The importer is notified of the discharging date of his produce which is off-loaded directly onto the collecting vehicle, which proceeds straight to its destination.

It is important to realise that a proportion of unitized shipments consists of perishable produce packed in light weight cartons or wooden trays. If the unit is strongly bound at each end with polypropylene, the unit will remain rigid. The corners of the load can be protected with angles of fibreboard or other material which will absorb the stress of the binding.

A.10 cans of deep frozen concentrated citrus juice are loaded direct onto expendable pallets, which are bound at each end and round the centre with polypropylene, for direct shipment to destinations in the Federal Republic of Germany. The cost of the cartons which were previously used to hold six A.10 cans has been eliminated; claims for dented and damaged cans have been reduced to a minimum; the supplier's return has been increased and the buyer enjoys the use of an expendable pallet. It is reasonable to assume that, as a result of further research, a similar method could be adopted for smaller cans, based on the shrink wrap system.

In this connexion, it is important to consider the impact of unitization on deliveries to the retail outlets. Many networks are now equipped with transport fleets incorporating hydraulic tail lift equipment which enables quick and safe delivery of merchandise on wheeled pallets with collapsible wire sides and ends. In some cases, roller-type equipment is also incorporated which enables pallets and units to be loaded and moved to the rear of the vehicle without difficulty. A store with an adequate and fast sales turnover and suitable equipment could handle bulk loaded shrink wrapped pallets advantageously.

This system of unitized retail deliveries has evolved from research into labour saving methods, ensuring reduction of damage, and accelerated

turn-round times. Vehicle delays are costly and can also lead to infringement of parking regulations and laws specifying maximum drivers' hours per day.

### Containers

This is another comparatively recent, but great advance in modern transportation, many facets of which have to be carefully considered.

- i) Containers are of varying capacity ranging from ten to forty tons; there being three basic types: unventilated (for dry goods, machinery), ventilated and refrigerated using ship's power or 'clip-on' cooling units for subsequent transport;
- ii) Special container vessels have to be constructed to provide the necessary service: this involves heavy capital investment;
- iii) Special termini have to be provided with heavy lifting equipment for the efficient handling of the containers, as quick turn-round times for the costly vessels are essential;
- iv) Containers dimensions should enable unloading onto road vehicles or flat rail cars;
- v) Stowing or "stuffing" a container can be complex, as "stuffing" with individual packages is a labour-intensive and costly operation.

It is, therefore, obvious that unitization should be incorporated with a container service, every care being taken to ensure maximum space utilisation, as containers can be stuffed without side loading if appropriate roller-type equipment is used.

The main problem arises with refrigerated containers since the internal dimensions are reduced by insulation. It has been found that 100 x 120 cm. unit, which is the most advantageous for standard fresh produce packs, is unsuitable, whereas other unit dimensions result in a loss of stowage space. Research is being carried out to find a solution, but for the reasons outlined above, this will not be easy.

It should also not be forgotten that the economics of container traffic are greatly affected by the availability of return cargo. Furthermore, in view of the heavy capital investment, a detailed study of present and future prospects must be made before a service is initiated.

#### Roll-on/Roll-off

Another efficient development in modern transport, it is becoming an increasingly popular means of transport between the European Continent, the United Kingdom and Scandinavia. Licensing and driving formalities have been reduced to a minimum, although the United Kingdom has not yet acceded to the Continental 40 ton authorized load. As a form of transport, it has become a highly organized industry with firms co-operating at international level. As a result of these activities, a large number of the haulage contractors are able to secure return loads with a consequent economic advantage to the respective users.

Two operating methods are used: either a vehicle, or vehicle and trailer, proceeds direct from loading point to destination, or an articulated trailer is loaded at despatch point and hauled to the ferry by the towing unit. The trailer is then uncoupled and upon discharge, another towing unit, operating in the receiving country, is coupled to the trailer and tows the load to point of destination. One advantage of the latter system is that it releases the towing units for further operations.

The same system is often used internally. A loaded trailer can be brought to a depot for unloading, and the same towing vehicle can be coupled to an empty trailer for another load.

In countries where a freight-liner service is operated by the railways on a pick-a-back system, trailers equipped for both road and rail are loaded, picked up by towing units and taken to the freight-liner terminal and coupled onto the pick-a-back system, using trains scheduled for various destinations. The trailers are then uncoupled at the destination rail-head, coupled to towing units and taken to their final destination. This system is efficient, fast and economic. Unitization is essential in this operation, if full advantage is to be obtained from the speed of the operation.

With any roll-on/roll-off system the load should be unitized. Using roller-type equipment, vehicles can be loaded with unitized cargo and the possible small loss of loading space is more than compensated for by the minimum use of labour, reduction of damage to the product, and the vital quick turn round of the vehicle, especially when a return load has to be picked up and the legal operational hours of the driver are running out.

### Distribution from main ports

Many co-operative organisations are studying the advantages of radial and international distribution from main ports such as Antwerp and Rotterdam, and to a certain extent, such ports as Dieppe and Le Havre. It is felt that large cargoes of commodities internationally marketed, either palletized or containerized, could take advantage of the facilities of such ports for international distribution. This would be carried out by road, rail, or sea on smaller vessels specially equipped to handle containers or roll-on/roll-off vehicles.

One example of the efficiency of this system is the constantly increasing traffic between the Dutch and Belgian ports and the British port of Felixstowe, which is efficient, quick and economic. The resurgence of smaller ports which have taken steps to provide adequate facilities is a significant development in this sector.

### Warehousing and Storage

This is a vital link in the production and marketing chain which calls for careful research and study of local conditions.

It is generally agreed that for food processing, whether canning, dehydration, chilling, freezing or packing the fresh product, the ideal layout is a lofty, single storey building, either under a single span or with a minimum of supporting pillars. Where land is available at low or reasonable prices this has often been achieved but, equally often, in spite of careful planning, space is suddenly at a premium. The storage of cans, boxes, cartons, and unitizing materials, however carefully merchandised, make heavy demands on storage space. Many modern canneries, packing houses, warehouses and markets have proved the efficacy of adjustable and movable stainless steel racking

These rackings are available in various types and load carrying strengths, dependent on the type and weight of load to be handled. With suitable fork-lift equipment, a height of 6 metres of racking can be handled easily and efficiently. In the case of port warehouses, where goods are held in transit pending the arrival of the transporting vessel, the same arguments apply, and operations are greatly facilitated by unitized loads.

### Cool and Cold Storage

The type of cool or cold storage, related to the products to be handled, and its location or locations need very careful study and planning.

Any form of cool, cold or air-conditioned storage is costly. Full advantage must be taken of the most modern equipment available: failure to do so would be false economy. Furthermore, the quantities and types of products to be stored must be individually assessed, and the storage time must be ascertained. In co-operation with research stations and technicians, the method of storage best suited to the planned operations can be identified.

Should the product or products be produced in a relatively isolated area and subjected to heat during transit, consideration should be given to the establishment of small but adequate pre-cooling plants to remove the "field heat" and the provision of insulated transport. For example, strawberries grown in Kent some 75 kilometres from London are picked after the dew has dried and then pre-cooled (i.e. the "final heat" is removed) before being delivered to distributive depots or markets in the cool of the evening. This system has increased the shelf-life of strawberries subjected to the unfavourable environmental conditions of large stores from a doubtful one day to a safe two days. The improved quality offered to the consumer and lack of possibly heavy loss through wastage more than compensates for the operation involved.

### Canning and Processing - Storage requirements

In most countries it is an accepted fact that a cannery, if it is to be profitable, should work at least ten months a year.

Assuming that the basic products available for canning and processing

are citrus fruits, (juices, segments, by-products), peaches, apricots and tomatoes, the type of storage needed, if any, to extend the plant's operational season should be identified. It should also be established whether it is economically feasible to produce or obtain locally the additional ingredients needed for fruit salad or fruit cocktail if feasible, the type of storage necessary to extend the working season and keep the raw material in optimum condition should be ascertained.

Frequently, consideration is given to the canning of vegetables as an additional or fill-in operation. In view of the heavy production, almost over-production, of basic vegetables, such as peas, beans, carrots and spinach in many European countries, the profitability of such a venture would be highly suspect.

If fragmentation of storage installations can be avoided, costs will be reduced. The maintenance of sophisticated machinery is vital but costly. Skilled personnel are essential to the efficient and productive running of cool and conditioned air stores. Taking into consideration the geographical centres of production, the greater the concentration of storage, especially with easy access to ports, the greater the advantages which will accrue.

The scientific storage of potatoes has reached a high level through the use of methyl bromide as a protection against blight. Small potatoes of good quality, peeled and prepared, either canned or bottled (preferably canned for export) are in demand as a convenience food.

### Fish

For a variety of reasons, from pollution to over-fishing, many varieties of fish are in short supply. Herrings, once a basic cheap food in the United Kingdom and especially in Scotland, are becoming scarce, as are soles, prawns, lobsters and good quality eels. This notwithstanding, the demand for sardines, tuna, mackerel fillets, prawns and other crustacea should remain active.

In order to reduce costs and handling, it is important that the number of packs be reduced to a minimum, concentrating only on those which have the greatest popularity. It goes without saying that hygienic and sanitary



conditions should be at the highest level and that this fact should be publicized adequately.

Although frozen fish is a major industry, the operation is highly sophisticated, and plant for processing, storage and transport extremely costly. Any such venture should be approached with caution and only after research in depth.

### Meat

In many countries there is a shortage of good quality beef. Bearing in mind the transit time involved, it is assumed that exports would consist of chilled rather than frozen products. It would also appear that such products as mince, casings and possibly dehydrated beef, would be exported for processing and catering, rather than for retail sale. Consequently, the packaging and quality standards would be organised in co-operation with the importers.

### Airfreight

The air transport of out-of-season produce needs careful organisation. Despite the rapidity of transit, highly perishable products, such as strawberries, must be pre-cooled. In order to achieve maximum space usage, special pallets which fit the aircraft holds are used, with a removable superstructure to indicate the height and shape of the hold while the pallet is being loaded. Expanded polystyrene is a very suitable material for air shipments. It is light and rigid; it can be pre-cooled and will retain the cold upon discharge from the aircraft. Polystyrene trays have been used successfully for grapes as well as for small packs of strawberries.

As in the case of major transit seaports, airports such as Frankfurt have been selected for onward radial distribution, by virtue of the link-up with other aircraft and the rapid road vehicle distribution.

Pre-cooling should preferably take place at the airport even if, on account of the distance, the product has already been pre-cooled at point of production.

Air-freight containers have been designed which will fit the hold of freighter aircraft, which will retain the temperature evenly with a maximum variation of 1° in 24 hours. It is claimed that a near static storage temperature can be maintained long enough to meet world-wide transportation requirements.

### Marketing Procedure

There are a number of first-class marketing organizations in North and West Africa.

The Moroccan O.C.E. with its citrus marketing organization has been very successful in a highly competitive field in view of the overall surplus production of citrus fruit in the Mediterranean area.

The marketing of pineapples and bananas from West Africa has also been most successful.

These achievements must be emulated in all sectors in the interests of future development.

### Co-operation and Consultation

In any development, with the impact of modern technology, new methods of packaging, transport and distribution, it is essential to establish the highest level of co-operation and consultation. Standards of quality must be established and rigidly adhered to by all operators. One careless or indifferent operator can have serious repercussions upon the whole of an industry. Packaging methods must also be agreed upon and standardized. With the creation of a sufficient volume of demand, there will be an incentive to suppliers and manufacturers not only to offer the most economical prices and favourable terms, but to carry out research, share problems and give technical advice and assistance. In the field of transport, co-operation and co-ordination of cargoes is vital. Costs are continually rising in all fields. Shipping companies, air charter companies and haulage contractors cannot offer advantageous rates on the basis of vague cargo estimates and illusory promises. If competitive rates are to be secured consistently, transport must be used to the maximum

possible extent and cargo commitments honoured in the absence of unforeseen catastrophes.

Publicity, even on a modest scale, will be far more productive, if operated on a co-operative basis.

### Methods of Contact

It is important that contacts be established with colleagues or interested parties in foreign countries and neighbouring territories for exchange of information and the integration of mutual interests.

A number of voluntary committees could be formed to co-ordinate

- i) Packaging
- ii) Standards
- iii) Transport

and an office could be established in a suitable and convenient focal point.

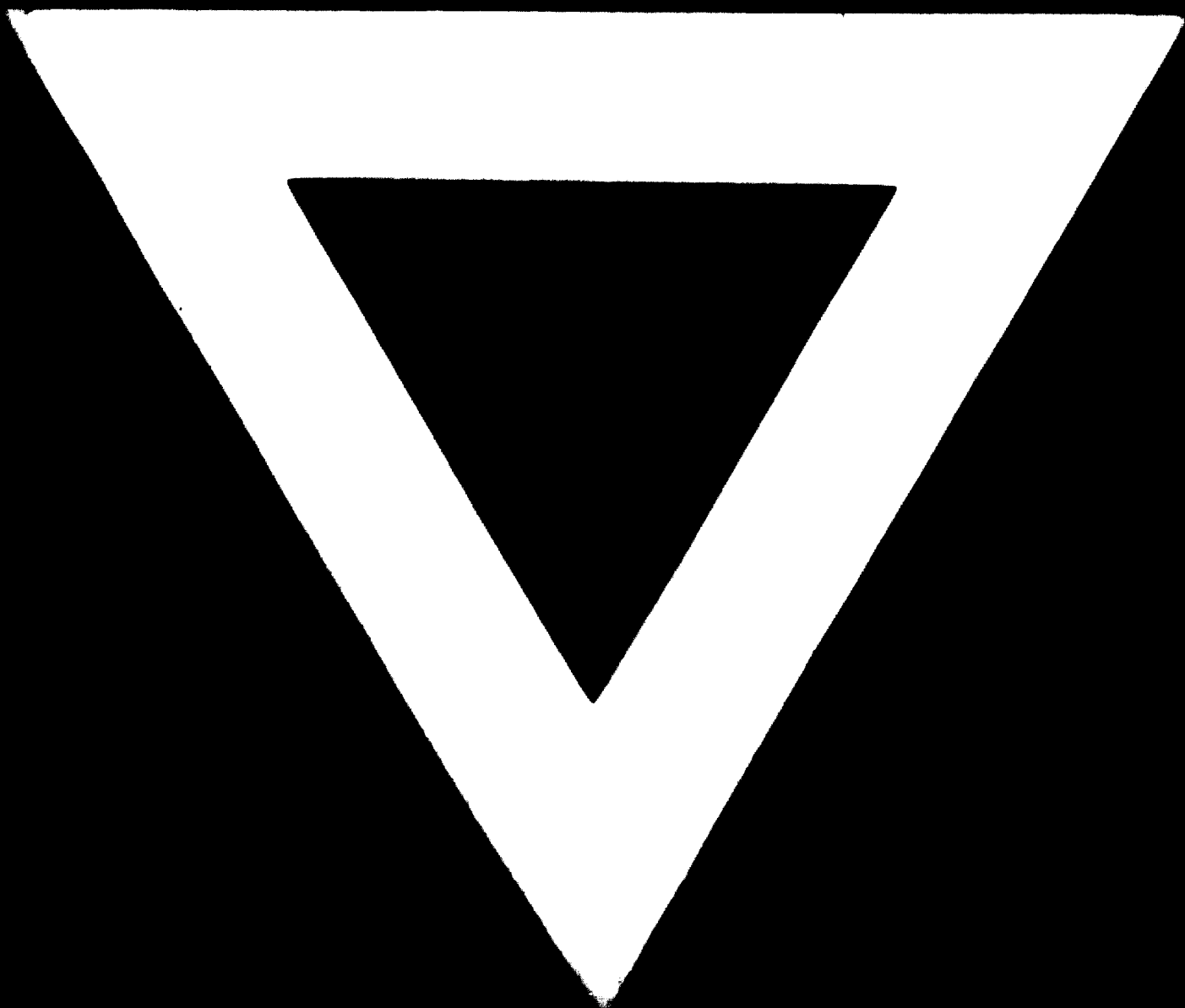
The office would provide a contact point for foreign organizations interested in co-operating or investing in the various fields of development, or in the exchange of information by establishing these lines of communication, enquiries and information could be transmitted to the appropriate sources with a minimum of delay. So often in the absence of a suitably informed office, enquiries can be misdirected and the whole operation becomes tedious and unproductive and interest is lost. However, it is not suggested that there would be any interference with the activities of any organisation or individual, since the office's function would, in fact, be that of a consultative organization, with special reference to future developments.

### Marking and Labelling

This is both a vital sales and legal requirement. Unfortunately, there is still no internationally agreed form of marking and labelling, and standards are lacking. The British Trade Descriptions Act is strict and rigidly administered. It does not, however, correspond to the requirements of other countries.

While it would have been desirable and rewarding to have provided information at an international level, such an operation is impossible and any attempt to give guidance on broad lines could be misleading and lead to consequent losses. It is vital that the individual marking requirements of all importing countries with which trade is envisaged, should be secured, preferably by the Ministry of Agriculture, and circulated to interested exporters. Only then can can labels, wrapping materials or even descriptive labels be ordered so as to avoid infringement of the individual countries' regulations. Through an oversight on one occasion, many thousands of cartons of dates had to be re-labelled at considerable expense to comply with British regulations. The same difficulty has been encountered with phytosanitary regulations. The British National Farmers' Union endeavoured to establish a common ground for flowers, fruit and vegetables, but after lengthy research this proved impossible. Submissions for an international agreement on basic phytosanitary regulations, allowing the super-imposition of individual countries' special requirements have, as yet, produced no results.





**74.10.1**