

Report on the
Fruit and Vegetable Murrabba
Industry in India
1956



GOVERNMENT OF INDIA
STRY OF FOOD AND AGRICULTURE
DIRECTORATE OF MARKETING AND INSPECTION

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Marketing Series No. 97.

Report on the Fruit and Vegetable Murrabba Industry in India 1956



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GOVERNMENT OF INDIA
MINISTRY OF FOOD AND AGRICULTURE
DIRECTORATE OF MARKETING AND INSPECTION

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PREFACE

The Central Fruit Products Advisory Committee constituted under Clause 3 of the Fruit Products Order, 1955, issued under Essential Commodities Act, 1955, in their 1st meeting held on 26th and 27th April, 1956, constituted a Sub-Committee to enquire into the Murrabba Industry in India. The Sub-Committee submitted its Report during the 2nd meeting of the Central Fruit Products Advisory Committee held on 31st October and 1st November, 1956. The Committee in its Resolution adopted the Report of the Sub-Committee and recommended that the various authorities may be requested to take further necessary action for development of the Fruit and Vegetable Murrabba Industry in India.

This Report is being published with a view to acquainting the public with the Murrabba trade in general and in particular help the Murrabba manufacturers and those who are interested in this trade. The Sub-Committee has covered all the grounds of the reference made to it and has done a commendable job in a short time in presenting the status of the Murrabba Industry in India particularly in the North, problems faced by the Industry with suggestions to overcome them.

I have every hope that this Report would be taken in the spirit in which it has been intended. I hope that the recommendations contained in the Report would be put into effect by the various authorities as well as the manufacturers. It is likely that some of the recommendations may not find favour with the manufacturers but in the broad interest of the manufacturers themselves and in particular the interest of the consumers which should come as the primary consideration in any article of food I venture to suggest that the development of the Murrabba Industry in India would not be feasible unless serious attempt is made to implement suggestions contained in the Report. The potentiality of development of this important sector of Fruit and Vegetable Preservation Industry in India would not be fully exploited unless adequate steps are taken by all concerned.

As the Chairman of the Central Fruit Products Advisory Committee, I acknowledge the work done by members of the Sub-Committee and particularly commend their team work. I would fail in my duty, if, I do not acknowledge the co-operation extended to the Committee by the manufacturers, various State authorities and the esteemed officers of the various institutions who have given their help in giving their views on the subject.

(iv)

The views expressed in the Report are of the Central Fruit Products Advisory Committee and the Government of India is in no way responsible for the views contained in the Report. The notes of dissent by two members of the Committee are also enclosed in the Report.

M. B. GHATGE,
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to the Govt. of India.*

DIRECTORATE OF MARKETING AND INSPECTION,
MINISTRY OF FOOD AND AGRICULTURE,
GOVT. OF INDIA.

NEW DELHI:

Dated 30th Nov. 1956.

REPORT ON THE FRUIT AND VEGETABLE MURRABBA INDUSTRY IN INDIA, 1956

1. Introduction

The Central Fruit Products Advisory Committee constituted a Sub-Committee to enquire into the Murrabba Industry in India. The terms of reference of the Sub-Committee were :—

“To survey the present status of the Murrabba Industry in India particularly in the North, study problems faced by the Industry and make suggestions to overcome the problems as well as suggest plans for its development.”

The members of the Sub-Committee were as under :—

- | | |
|---|----------|
| 1. Dr. Girdhari Lal, Assistant Director, Central Food Technological Research Institute, V. V. Mohalla, Mysore. | Chairman |
| 2. Shri N. S. Pochkhanawala, C/o M/s. D. and P. (Private) Products, Bombay | Member |
| 3. Shri Madan Lal, C/o M/s. Hira Lal Panna Lal, Khari Baoli, Delhi. | Member |
| 4. Shri Manohar Lal Aroura, M/s. Aroura Fruit Industry, Charbagh, Lucknow. | Member |
| 5. Shri P. H. Bhatt, Senior Marketing Development Officer, Directorate of Marketing and Inspection, 'P' Block, New Delhi. | Convener |

The Sub-Committee was constituted on 27th of April, 1956, and held its first meeting on 28th April, 1956. The Sub-Committee decided to issue questionnaire for collecting information from the manufacturers and the various authorities concerned. The questionnaire was issued to all the 74 preserve manufacturers licensed under Fruit Products Order, 1955, in India. The replies have been received from as many as 48 manufacturers. On getting the preliminary data, the Sub-Committee held its second meeting on the 16th August and subsequent meetings from time to time in the course of the investigation up to 26th August 1956. The Sub-Committee visited the important centres of production like Delhi, Amritsar, Lucknow and Banaras. Besides visiting the large number of factories in the manufacture of Murrabba, the Sub-Committee interviewed various individuals in their personal capacities and also associations to get proper background material for assessing the position of the Industry and for presenting the Report in the form and manner prescribed in the terms of reference.

The Report is divided into following sub-heads :—

- (1) History of the Industry;
- (2) Methods of manufacture;
- (3) Existing status of the Industry;
- (4) Quality;
- (5) Research;
- (6) Finance; and
- (7) Demand and prospects.

The recommendations of the Sub-Committee are made while discussing the various aspects. The summary, at the end of the Report, enumerates the various recommendations.

2. History of the Industry

The "Murrabba" could be defined as a preserve which utilises the principle of high concentration of sucrose for preservation and aims at retention of the shape and nature of the original fruit or vegetable. The Murrabba Industry is one of the important sectors of the Fruit and Vegetable Preservation Industry in India. The history of the Murrabba Industry is linked with the indigenous system of medicines particularly the *Unani* system of medicines. Although large number of fruits which are employed in the preparation of Murrabba such as amla, harad, etc., have their origin in India, the use of these fruits in form of Murrabba has not been indicated in the literature of *Ayurveda*. No doubt various properties and administration of such fruits in *Ayurveda* has been extensively known but the use of these fruits in the form of Murrabba have not been indicated. The *Unani* system of medicine adopted the various usages of these fruits from *Ayurveda* but instead of the preparations and practices recommended in *Ayurvedic* literature, the *Unani* system thought about preparation like Murrabbas for the administration of these fruits. It may be mentioned that the word Murrabba is derived from *Arabic* language. In *Arabic*, the meaning of Murrabba is preserved or domesticated. Murrabba is actually preserved or domesticated in sugar. The indication that the *Unani* system of medicines has followed the principle of use of varieties of fruits from *Ayurveda* is evident from the fact that what is known in *Ayurvedic* literature as 'amal' has been translated in *Arabic* as 'amlaj', in *Farsi* as 'amla' and further in Latin as 'embica'. The *Unani* system of medicines only went further in administering the preparation of these fruits in the form of Murrabba and hence the Murrabba Industry.

The Murrabba Industry flourished considerably during the Moghul Rule in India because of the State patronage. The easier availability of varieties of fruits in India also may be responsible for its development. In the West Asia, however, the Industry does not seem to have flourished perhaps mainly due to the non-availability of the fruits.

The Murrabba Industry seems to have developed mainly due to following reasons:—

- (i) It gave the easiest method of preservation of varieties of fruits.
- (ii) The method of preservation retained the shape and nature of the original fruit which made it more attractive.
- (iii) The method of preparation and its subsequent preservation made certain fruits more palatable and presentable so that they could be utilised. The fruits which were highly nutritive and which were valued for their medicinal properties but could not be consumed directly due to astringent and other objectionable tastes, were preserved after making them palatable and their benefits retained.
- (iv) The preservation of varieties of fruits made them available all throughout the year so that they could be used during the off seasons.

Murrabbas are mainly used either for their medicinal properties or in some cases as a sweet. The question of medicinal properties of Murrabbas have been examined in detail. Large number of claims are made with reference to the medicinal benefits of Murrabbas. Although no scientific verification of the claims exist it can be safely said that certain Murrabbas do have

definite medicinal properties and have been found to give positive and consistent results in certain treatments. To enter into the vast scope of medicinal attributes of Murrabbas would be out of scope of the present investigation, however, to ignore this factor completely would not do justice to the enquiry into this Industry. As such, following summary is presented to give the various attributes which are assigned to different preparations.

Medicinal value of murrabbas according to unani system of medicine

S. No.	Name of preserve	Properties
1.	Amla	Imparts energy to heart, brain and liver. Stops diarrhoea. It is also useful as a remedy for giddiness.
2.	Apple	It is a specific tonic for heart and brain, it relieves physical heaviness, it is a remedy for paralysis and mental burden.
3.	Harad	It cures permanent constipation and imparts energy to stomach and brain.
4.	Ginger	It removes congestion in the chest, removes flatulence ; is a good remedy for all stomach ailments, it gives energy to the kidneys and the waist, is an effective tonic.
5.	Petha	Imparts energy to heart and brain, acts as laxative.
6.	Pear-apple	Imparts energy to heart and brain.
7.	Bihl	Gives energy to heart, brain and stomach; is a good medicine for mental breakdown, heaviness of the body, etc.
8.	Belgiri	Is good for curing dysentery; also checks diarrhoea.
9.	Pine-apple	It acts as tonic, remedies mental diseases and relieves excess of heat in the heart.
10.	Carrot	Imparts energy to heart and brain, clarifies voice.

Keeping in view the above claims, the Sub-Committee feels an urgent need of investigation so that the benefits of such indigenous preparations could be utilised for curing the various ailments of our population. The approach in this direction was made to the Director of the Central Drug Research Institute, Lucknow. He has agreed to undertake research work on specific Murrabbas. The Director of the Laboratory was of the view that there are grounds for attributing medicinal benefits to the various preparations as it is thought that in spite of the harsh treatment during the processing of fruits there are certain bodies like *Antracin* or *Phenolic* which are retained in small amount. There may be also certain *Sinergenic* action in the use of Murrabbas as vehicles in different *Unani* preparations. But these are only points of view to the subject and cannot be said to have been established by the process of scientific research. He was, therefore, of the view that if Central Food Technological Research Institute, Mysore, were to prepare sample of varieties of Murrabbas, his Laboratory would be in a position to examine and confirm or otherwise, specific but not general, claims made with regard to medicinal benefits of the product. Prior to planning and experiments in this direction, the Director, Central Drug Research Institute, wanted a comprehensive information on the type of ailments for which particular types of Murrabbas were assessed to be specific cures. It is recommended that an attempt, in this direction, may be made to investigate the claims set out above

It may, however, be mentioned that the claims made with reference to the various Murrabbas according to some authorities would only be derived if the preparations of the Murrabbas are carried out as prescribed in the literature and not as being practised by the Industry. It is thought by these authorities that the existing method of manufacture do not leave enough of important ingredients which would be responsible for attributing medicinal benefits to the Murrabbas. In some cases, it is described that the existing methods of manufacture leave only cellulose impregnated with sugar and its inverted products in the fruits. It would be, therefore, worthwhile examining different kinds of products manufactured according to different methods so that a comparative study could be instituted.

3. Manufacture

Having discussed the history and the background of the use of Murrabbas it would be desirable if the methods of manufacture employed at present are described before we proceed further in the matter.

The method of manufacture as described in the literature of *Unani* system of medicines is as under—

The fruit which is converted into Murrabba should be fully ripe. The fruit may be peeled or used unpeeled according to the nature of the fruit. The fruit is first cooked in water to such a stage that it becomes slightly soft. The fruit is removed from water and is spread out for drying. The fruit is then pricked with wooden or bamboo pricks and transferred to concentrated sugar solution or honey. On subsequent day when the syrup thins down, the fruit is removed from the syrup and syrup reheated till it becomes sufficiently thick. This process is repeated till the sugar solution no longer thins down. It is also stated that in some processes the water used for first cooking is used for preparation of syrup while in certain cases the fruits are cooked in steam for softening.

Some of the Murrabba manufacturers whose activities date back to over 140 years have also indicated that about 40 years back the Murrabbas were preserved according to the method described above.

Certain modifications have been introduced in the above method of manufacture mainly from the point of view of two considerations (1) the appearance and taste of the finished product and (2) to increase the production by quickening the process of manufacturing. In achieving the first objective, the manufacturers adopted heavier blanching, (boiling in water), more washing of the fruits after blanching, use of chemicals for bleaching, use of firming agents like lime, alum for obtaining better structure and texture of the fruit, removal of more soluble solids to remove astringencies of the various products for better palatability.

With regard to the second objective, the manufacturers started using dry sugar instead of syrup so that the concentration desired at the finished product level could be obtained in two or three cookings. Further, to keep up the pace with production during the peak period of different varieties of fruit the system of semi-finishing of the product and storing came into vogue.

The process followed at present by most of the manufacturers is as under :—

The main items of production according to order of importance are apple, amla, harad, carrot, ginger, petha, karonda, pear, bail, bihi and mango. Small quantities of other fruits and vegetables are also produced.

The fruits or vegetables as soon as they arrive from the market are scraped or peeled if required. The fruit is then punctured with the aid of sharp iron, brass or stainless steel pricks. The peeling and pricking operations are carried out by the labourers sitting on the floor. In some cases after the fruits are pricked, the fruits are blanched although in cases where the fruits are harder the pricking follows the blanching. The fruits are removed from hot water by means of baskets, which easily drain off water. Some fruits are kept in lime water or treated with alum for hardening. Apples are blanched by addition of hypo-sulphite in the blanching water. The fruits are kept in a trough or vessel and covered with dry sugar. Fruit and sugar are left over-night. Next morning, the syrup is drained out and a further quantity of sugar is added to the syrup to bring it to higher consistency. The sugar concentration of this syrup is between 60 to 75 per cent sugar. Some manufacturers boil the fruit and syrup together. At this stage, the product is deemed to have been semi-finished and is stored generally in four gallon canisters. The product is stored for a period of 4 to 21 days depending upon the stage of fermentation in the product and the pressure of work. The fermentation slows down during cooler months but in July, August and September fermentation is much quicker due to outside temperatures and hence the product is processed in a quicker succession. The semi-finished product is allowed to be fermented to the extent that due to the evolution of gas the entire product swells up and fills the head space left in the canister. But when the pressure of work is excessive the product is not inspected but left to ferment till such time the production schedule permits further processing. Indeed, fermentation slows down after some time due to autolysis. The manufacturers do not realise the losses which occur due to consumption of sugar by the process of fermentation.

The fermented product is removed and further put to boil and if required an additional quantity of sugar is added to the syrup. In some cases again, the fruit and syrup is boiled together while in some other the fruit is left out. The hot syrup is spread over the fruit and allowed to cool. The finished product is filled into canisters and the bung hole is soldered.

It is a general practice to re-examine the goods prior to sale. In many instances, it has been observed that product continues to ferment even after the so-called finished product stage has been attained. In this case, the product is again given re-cooking to bring up the sugar concentration at the desired level and also to check further fermentation. However, when the demand is good, the products are sold immediately after the finished product stage is attained which in many cases produce fermentation at retailer's or consumer's end. The fermentation, it is contended, helps in softening the fruit tissue and facilitates impregnation of sugar to the inner portions of the product. It will be observed from the above that the present system of manufacture has adopted fermentation technique as an essential feature in the processing. It is contended by the manufacturers that without the aid of fermentation in processing, the desired finished product could not be made.

The Sub-Committee went into the question of fermentation at great length. Several samples of preserves which were shown to the Sub-Committee as having completed the finished product stage were examined on the spot for soluble solid content. This was done with the help of hand refractometer. It was observed that there was a considerable difference between the soluble solid content on the outside of the fruit and at the centre of the fruit. This difference was particularly marked in the product like apple-murrabba. It was, therefore apparent that although the fermentation could function at the centre of the

fruit because of the lower concentration of sugar at the circumference of the fruit, the product would look normal. When the product is stored or packed in four gallon cannisters or even in open top cans they continue to ferment and produce gas. In open top cans when sterilization has been done adequately, it has been observed that the fermentation is almost completely checked. As a result, the large number of samples collected from various sources have indicated positive fermentation during the test at the laboratory of the Central Food Technological Research Institute, Mysore. The results of research at the Central Food Technological Research Institute, Mysore, have shown no relation between fermentation and impregnation of sugar in the product.

Incidentally, it may be mentioned that barring one or two manufacturers none of the manufacturers have any facility to check soluble solid content of the finished products. The quality of the product is checked mainly by the experience of the processing man and in many cases it was evident that there was a lack of supervision from responsible quarters. Granting that experience plays an important part in judging the finished product, the Sub-Committee felt that unless a close supervision and check was exercised in processing the product the quality standard could not be maintained at the level which would preserve Murrabba satisfactorily for a longer durations.

After the above discussion, the Sub-Committee feels that no case has been made out to alter the existing specifications of preserves under Fruit Products Order, 1955. The specifications of preserves in Part XXII of Schedule 2 of the Fruit Products Order are as under.

Product	Kind and variety of fruit	Minimum percentage of fruit in final product	Minimum percentage of total soluble solid in the product	General characteristics
Preserves	Any fruit of suitable variety.	55	68	It may be a single or mixed preserve but fruit or vegetable used shall be mature, fresh, sound and clean. The only substances that may be added are sugar, invert sugar or liquid glucose, jaggery, citric, tartaric or malic acid, ascorbic acid, harmless food colours, flavouring matter, and sulphur dioxide to the extent of 40 p.p.m. or sodium benzoate to the extent of 200 p.p.m. as preservative. The fruit shall retain form and shall be permeated with the syrup without shrivelling of the individual pieces. It shall be of good keeping quality and attractive colour and it shall be free from burnt and other objectionable flavour, crystallisation and mould growth. The product shall not show any fermentation when examined. When packed in cans, it shall show no positive pressure at sea-level.

When packed in sanitary top cans, the content shall not be less than 85 per cent of the total space of the can.

4. Existing status of the Industry

The number of factories engaged in the manufacture of preserves in India as compared to the total number of factories engaged in the manufacture of fruit products are given in Statement No. 1 below for the years 1952 to 1955.

STATEMENT NO. 1

Estimated production and value of all fruit products and murrabba

Year	Total No. of F. P. O. licences	Total No. of factories licensed for preserves	Total quantity of production of all fruit products (Tons)	Total value of production of all fruit products (Rs.)	Total quantity of production of preserves (Tons)	Total value of production of preserves (Rs.)	Percentage of Production of preserves
1952	572	..	11,741	1,38,33,843	1,326	16,40,115	11.3
1953	602	..	14,216	1,58,64,305	1,015	11,57,315	7.14
1954	662	119	11,541	1,61,60,081	1,193	15,18,777	10.33
1955	654	74	..	..	*745	8,40,615	..

- *Figures for 26 manufacturers only.

The distribution of the preserves manufacturers in India is as under:—

Delhi	18
Amritsar	17
Calcutta	8
Bombay	7
Banaras	4
Lucknow	3
Other cities	17
TOTAL	74

The production is well concentrated in Delhi and Amritsar and it could be said that nearly 80% of the production is divided between these two centres.

Although the estimated production of Murrabba according to the figures submitted to the Directorate of Marketing and Inspection by the licensed manufacturers is 1,200 tons (32,760 mds.) on an average as mentioned above, the Sub-Committee feels that the estimates are much on the lower side. From the evidence collected during the course of the enquiry and further particularly looking into the investment pattern, the consumption of raw-material, production activity of manufacturers and the production capacity of the total estimated *Bhaties* indicate that the production would be in the neighbourhood of 65,520 maunds (2,400 tons) by the licencees under Fruit Products

Order, 1955. To this, a considerable quantity of unauthorised manufacture may have to be added. This quantity may be estimated at 16,380 maunds (600 tons). The total production, therefore, would be safely estimated as 81,900 maunds (3,000 tons) valued at Rs. 33 lakhs or above.

Raw material requirements.—The major raw materials required in the manufacture of preserves are fruits, vegetables, sugar, fuel, tins, chemicals, labels and other packing materials. From the information collected from 45 manufacturers who replied to the questionnaire issued by the Directorate of Marketing and Inspection, the following requirements of different fruits and vegetables have been estimated.

STATEMENT NO. 2

Estimated yearly requirements of fruits and vegetables of 45 murrabba manufacturers

Sl. No.	Name of fruits and vegetables	Total requirements (Mds.)	Total value (Rs.)
1.	Apple	8,220	2,51,550
2.	Amla	7,663	1,87,949
3.	Harad	3,195	69,455
4.	Carrots	3,020	14,620
5.	Petha	2,997	22,586
6.	Pears	1,386	12,033
7.	Ginger	463	9,897
8.	Bail	591	7,054
9.	Bihi	514	6,748
10.	Karonda	373	5,305
11.	Others	900	7,610
	TOTAL	29,322	5,94,807

The evidence given by the leading manufacturers showed that from one maund of fresh fruits the finished product yield was nearly $1\frac{1}{2}$ times the fresh fruit weight of the product. From the above estimates, it can be said that the production of the 45 firms on the basis of fruit to finished product ratio would be from 30,000 maunds of fruits, 45,000 maunds of finished products. This goes to prove that the production figures consolidated from the production statements received from the manufacturers would not be a correct indication of the total estimated production of the manufacturers.

The requirement of sugar has been approximately stated as $1\frac{1}{4}$ times the weight of fresh fruit. For 30,000 maunds of fruits sugar requirement would be 37,500 maunds. The estimated requirements from the figures supplied by

manufacturers is 32,000 maunds. The difference could be attributed to certain variations in figures in requirements of fruit which have been used for producing other products besides preserves. The value of sugar consumed by 45 manufacturers is Rs. 9,79,000.

If the figures of total production of 81,900 maunds are taken into consideration the estimated requirements of fruits would be 54,600 maunds and the estimated sugar requirements would be 65,520 maunds. The value of the fruits and vegetables at an average rate of Rs. 10 per maund (values given in the table are higher) will be Rs. 5,46,000. The value of sugar at the rate of Rs. 31 per maund will be Rs. 20,31,000. Therefore, the major raw material cost would be Rs. 25,77,000 for total value of Rs. 33 lakhs of finished product.

The tin requirements of 30 manufacturers who replied to the questionnaire is 90,000 four gallon containers and 4 lakhs open top sanitary cans. This estimate includes requirement for pickles also. The total value of this is estimated at Rs. 1,36,000. The cost of tin is charged separately by the manufacturers and is not included in price.

The next important raw material which the Industry requires is fuel. The total consumption of fuel is 26,000 maunds valued at Rs. 58,000 for 35 concerns who replied to the questionnaire. It may be estimated that the Industry requires about Rs. 1 lakh worth of fuel.

The requirements of chemicals, mainly fruit/acids (citric or tartaric), food colours, alum, lime, hypo-sulphates and preservative are rather small and generally are purchased from local market.

Investment pattern.—From the information received, it is reported that out of the 48 concerns which have replied to the questionnaire, 4 are public or private limited concerns, 24 partnership concerns, 18 proprietary concerns while the rest of them did not give information. It can be said that preserves industry is mainly in the hands of proprietary or partnership concerns. The investment pattern of the above units indicated that 17 concerns have invested below Rs. 10,000, 8 concerns have investment between Rs. 10,000, to Rs. 25,000, 13 concerns between Rs. 25,000, and Rs. 50,000, and 1 over Rs. 1,00,000. The total estimated investment of 39 concerns was Rs. 7 lakhs which included investment on land, factory, building, equipment, etc. Considering the above investment which nearly covers half the manufacturers, it is estimated that the overall investment in this Industry in India would be to the tune of Rs. 14 lakhs.

Processing areas of factories.—The Sub-Committee examined the question of availability of space in the different factories as compared to the production activity. In most of the cases it was felt that compared to the production the manufacturers did not have adequate space for preparation, peeling, processing, filling and storing of the products.

The sq. ft. area available in different units has been classified in Statement No. 3 on page 10.

It will be observed that although 12 concerns out of 42 had area over 1,500 sq. ft., the utilization of the area available did not visualise the proper flow of material. In most of the factories the production activity was concentrated at and around the *Bhaties*. The problem is further aggravated by lack of adequate number of men employed by the Industry. This question would be discussed at a later stage.

The Statement No. 3 also gives an idea of the total value of production compared to the sq. ft. area of the factories.

Worker.—The categorisation of factories can be further examined according to the number of permanent workers and the production.

The Statement No. 4 below gives an indication of 41 factories which have supplied information. The statement also indicates that the number of male and female workers and annual wages paid to them.

STATEMENT No. 3

Categorisation of factories according to area and production

Area (Sq. ft.)	No. of factories having production							Total
	Below Rs. 4,000	Rs. 4,000 to 10,000	Rs. 10,000 to 25,000	Rs. 25,000 to 50,000	Rs. 50,000 to one lakh	Over Rs. one lakh	Production not supplied	
50	..	..	..	..	..	..	2	2
50-500	4	3	..	2	..	..	..	9
500-750	1	3	1	3	..	..	1	9
750-1,000	1	1	2	2	1	..	..	7
1,000-1,500	..	1	3	1	1	..	2	8
Above 1,500	1	..	1	5	2	3	..	12
Data not supplied	..	..	..	..	..	..	1	1
TOTAL:	7	8	7	13	4	3	6	48

STATEMENT No. 4

Categorisation of factories according to number of workers and production

No. of workers (Permanent staff)	Number of factories having production							Total
	Below Rs. 4,000	Rs. 4,000 to 10,000	Rs. 10,000 to 25,000	Rs. 25,000 to 50,000	Rs. 50,000 to one lakh	Over one lakh		
1 to 5	4	6	3	8	1	..	22	
6 to 10	..	1	1	3	..	1	6	
11 to 15	..	..	..	1	3	..	4
Above 15	..	..	1	..	..	2	3
Data not supplied	2	1	1	2	..	..	6
TOTAL :	6	8	6	14	4	3	41	

STATEMENT No. 4—(contd.)

Workers	No.	Annual wages Rs.	No. of factories supplying information
Males	185	1,07,347	41
Females	98	35,100	
TOTAL	283	1,42,447	

Water supply.—The water supply plays an important part in maintenance of quality of the product and cleanliness of the premises. Under the Fruit Products Order, 1955, minimum quantity of water requirements for different categories of manufacturing has been laid down. From the figures available some of the factories are not having adequate water supply even to the minimum requirements of 250 gallons per day as prescribed under the Fruit Products Order, 1955. It is recommended that the factories should arrange better facilities for storage of water and should arrange with the local authorities for larger supplies.

Utilisation of power.—The Murrabba Industry is mainly a cottage and small scale industry in so far as it does not employ power. There are only five concerns who employ power mainly for running seamers or a pump. The total number of seamery employed by the Industry are 16 out of which only 11 are power-driven.

Bhathies.—Except a few concerns which are engaged in production of other items of fruit products besides Murrabba employ steam for preparation of Murrabba. It may, therefore, be said that Murrabbas are generally processed on *Bhathies*. The capacity of production of individual units is mainly limited to the number of *Bhathies* in a factory. Actually the production of individual factories could be more or less correlated with the number of *Bhathies*. Statement No. 5 below categorises the Murrabba factories according to the number of *Bhathies*.

The total number of *Bhathies* for the 43 concerns which replied to the questionnaire comes to 115. On this basis, it is estimated that on the whole there are 150 *Bhathies* under the licensed manufacturers under the Fruit Products Order, 1955.

STATEMENT No. 5

Classification of murrabba factories according to the bhathies

No. of Bhaties	Factories	Total Bhaties
1	6	6
2	21	42
3	10	30
4	1	4
5	3	15
Over 5	2	10
Not given	5	..
TOTAL	48	107

Working days.—The number of working days for the production of Murrabbas are indicated in Statement No. 6 below from the replies received from 44 concerns. It is observed that 50 per cent of the factories have working days between 250 to 300 days. Besides Murrabba, most of the manufacturers handle other lines like pickles which keep them busy during the off season of Murrabba. Generally the Murrabba manufacturing season starts in the end of July and finishes in March, the following year. During the slack season between April to June, the production is mainly confined to pickles re-processing of Murrabbas and manufacture of some items available during the season *e. g.* mango.

STATEMENT NO. 6

Estimated number of working days in a year for murrabba factories

No. of working days in a year	No. of factories
Below 150	6
150—200	6 (Average No. of working days 248)
200—250	2
250—300	23
300 and over	7
Not given	4
	48

General conditions of the factories.—During the visit at different centres of production, the Sub-Committee inspected more than 25 units. Besides this, the Sub-Committee was also shown the reports of the manufacturing premises available in the Directorate of Marketing and Inspection. The Sub-Committee was conscious of the fact that in most cases a special attempt was made during the time of their visit to renovate to a certain extent the manufacturing premises. In spite of this attempt, the Sub-Committee observed that the general conditions of the manufacturers in respect of hygiene and sanitation left much to be desired. This view is not only based from the general considerations but by some specific instances such as:

- (1) the fruits and vegetables in all factories were not washed prior to any preparation;
- (2) fruits and vegetables were peeled, pricked and prepared on floor and no tables were provided for this purpose;
- (3) no aprons or suitable headwears were provided to workers in the peeling section;
- (4) in many places, the manufacturers had no adequate space to undertake peeling, etc. and it was reported that these processes were carried out outside the premises;
- (5) in some factories the blanching of fruits was done by covering the vessels with old baskets and used cans put on the top to cover the fruit, etc. etc.

The general contention of the manufacturers was that it did not matter much how the different processes were carried out if the finished product had an attractive look and finish. It is a recognised basic principle that the quality of the finished product is primarily connected with the quality of the raw material. No matter how carefully one processes a bad quality raw material, the finished product cannot be made to attain the standard which would be of the first grade. Further, besides the quality of the finished product, the care in preparation and treatment of raw material reflected considerably on the losses during preparation. At present, there was no check whatsoever on the percentage of wastage incurred during the preparation of raw material. This fact is also borne out by the absence of supervisory staff in this section of manufacture.

The existing units in almost all cases are situated in thickly populated residential as well as business localities with unhygienic surroundings which are bound to reflect considerably in the conditions of manufacture. It is admitted that the surroundings of the factory were beyond the control of the manufacturers concerned. Further, the Sub-Committee felt that even if there was a will to improve the conditions and even if methods were employed to enforce such improvements, such an attempt would be only very short-lived and would not have the desired effect even to the extent of bringing the factories to a standard which would be acceptable from the point of view of minimum requirements. The Sub-Committee, as observed earlier, feels that the space available in individual unit was inadequate to carry out satisfactorily the processes involved even under the existing method of manufacture. For instance, the space required for receiving, washing, peeling, pricking and storage of raw material was hardly sufficient with almost all manufacturers. Actually in case of Delhi it was observed that barring one or two, none of them had any space of preparing material and the manufacturers had to engage outside agency for undertaking the work of preparation of raw materials. The conditions under which the preparations may be carried out by such outside agencies can well be imagined. The conditions definitely would be worse than those existing in factories because there would not be any control or supervision from any source even including the manufacturers.

The existing factories do not have adequate space to store the semi-processed products which are being stored in second-hand four gallon tins. Bung holes of these tins are generally not closed. In a limited space available, the tins are stacked and at times the lots which might have been prepared earlier are lost sight of and hence may undergo a longer duration of fermentation which would mean the loss in quality of product as well as loss of sugar to the manufacturers.

Even granting that few of the firms may have adequate floor space the existing method of handling of material and unsystematic flow of material from process to process concentrate processing activities, as already stated above, in a limited space around the *Bhathies*. This problem is further aggravated by shortage of labour as generally two or three men are attending to various processing like draining, blanching, concentrating, inspection of semi-finished stock, finishing, filling of the product, etc.

The Sub-Committee, therefore, feels that the only course for the healthy development of the Murrabba Industry is to shift the manufacturing activities from the thickly populated areas inside the cities. This basic consideration has made the Sub-Committee recommend that all possible assistance should be given to the manufacturers for shifting of the units to the healthier surroundings. The Industry cannot be developed unless a concentrated move in this direction is made.

5. Quality

Quality of Murrabbas has come under closer scrutiny since the establishment of a laboratory under the Fruit Products Order at the Central Food Technological Research Institute, Mysore. From April 1953 to March 1956 nearly 835 samples have been analysed. The results have revealed that as many as 50 per cent. of the samples did not conform to the specifications. The major defects in these samples were fermentation of the product or low soluble solids. The other defects noted by the laboratory were unattractive appearance, sugar crystallization, objectionable taint and flavours, etc. To remove these defects, we have already discussed in detail the various short-comings of the Industry in preparation, handling and manufacture of Murrabbas. The results of analysis further conform the existing unsatisfactory condition of factories and their working.

The Sub-Committee examined the question of quality in great detail and after prolonged discussion have come to the conclusion that the quality of the products cannot be even maintained up to the minimum standards required under the Fruit Products Order unless a basic change is introduced in methods of packing and processing of finished product. The Sub-Committee feels that so long as the Industry packs Murrabbas in four gallon cannisters or even any other types of cannisters or cans which are not hermetically sealed, the majority of the product would not come up to the required standard.

It may be emphasised here that the standards prescribed under the Fruit Products Order are the minimum and any relaxation in the standards would further adversely affect the prospects of the Industry and jeopardise the interests of the consumer. It is, therefore, considered opinion of the Sub-Committee that steps should be taken to introduce hermetic packing of Murrabba. In making this suggestion, the Sub-Committee has taken into consideration certain handicaps which the Industry faces to-day and particularly the *laissez faire* attitude which most of the manufacturers have towards several aspects of production and marketing of Murrabbas.

The majority of the members of the Sub-Committee, recommends that the entire Industry should cease to pack Murrabbas in any other packing but hermetic packing by 1st April, 1958. It is, however, considered that it would be in the interest of the Industry if the manufacturers resort to hermetically sealed packs with immediate effect so that by the said date, *i.e.* 1st April, 1958, they overcome all attendant hurdles in introducing the new packs as suggested above. The minutes of dissent in this connection of the two members of the committee may be seen on pages 19 to 21 of this Report.

Some of the manufacturers have represented strongly against the introduction of smaller packing for Murrabbas. They have felt that the customers to whom they cater desire to examine the products before sale and insist on varying quantities of fruit and syrup ratios. These difficulties are bound to occur in the initial stages, but once the products are standardised from point of view of variety, size, shape, colour and the drained weight ratio *i.e.* fruit to syrup ratio are standardised, these difficulties would not arise.

Introduction of packing of hermetic sealing would involve introduction of certain modern practices in methods of preservation. Each manufacturer would have to go in for either hand-seamer or the power-driven seamer in closing the cans and will have to purchase open top sanitary cans which are of international standard size and are used all over the world for packing of food products. The existing practice of bulk packing no doubt saves considerable amount of labour in respect of packing and enables the manufacturers to

maintain higher production in spite of limited space and labour. With the introduction of new packing, which, no doubt, would be costlier than the existing bulk packing of 36 to 40 lb., the manufacturers would have to engage more labour and introduce a systematic line of operation for handling of the product. The production would be more systematic. The cans will be washed and sterilized prior to filling. The filling weight of the Murrabbas would be determined and each can would receive an adequate quantity, duly and separately weighed. The filled cans then would be covered with hot syrup of desired consistency so that the ratio of the drained weight could be maintained and that the head space be controlled. The cans would be exhausted in a vessel of water-bath type or steam-type so that cans when sealed would have adequate vacuum. The hot cans would be seamed and then processed in boiling water adequately and cooled immediately. Once the products are processed in the above manner there will not be any chance of product to develop further fermentation or other spoilage. This introduction will revolutionise the Industry and would cure most of the ills. The Sub-Committee was given to understand that a scheme to subsidise the cost of open top cans up to the extent of Rs. 500 per ton of tin-plate is likely to be accepted by the Government. This would undoubtedly reduce the cost of packing and would easily enable the Murrabba manufacturers to change to new mode of packing. The Sub-Committee is also of the opinion that the Industry should consider the introduction of suitable glass containers for smaller packings.

It may be stated that the new process would require a certain amount of technique. This, however, is not a very complicated affair and if the labourers are properly trained and further if a slightly qualified personnel are selected for working in the factory, there should not be any difficulty in working of such factories.

The discussion on quality would not be complete without saying a word on quality control. It is considered that the manufacturers should immediately take up steps to check what they produce and check what they sell. Simple quality control method depending upon inner and outer concentration of sugar would go a long way in improving the quality of the product and decreasing the chances of further deterioration and spoilage which is of daily occurrence now.

While the above change may appear laborious and costly in the initial stages, the benefits to be derived both by the Industry and the consumer by saving of wastages, larger markets, better product, will outweigh these handicaps. It may also be mentioned that in spite of the provisions, under the Fruit Products Order for use of new cans or cannisters for packing of Murrabba the manufacturers have not yet changed over from the existing practice of using second-hand cans and cannisters of hydrogenated oil, *ghee*, etc. These cans are generally obtained from the second-hand dealers who collect hydrogenated oil cans, *ghee* cans, oil cans or cashew nut cans. The cans are got washed by a special agency who employs soda and found that they offered no better protection than new tins of equivalent gauge tin plate would offer. The manufacturers contend that the tins once used for packing of oil substances get a protection due to a covering of oil. This theory cannot be accepted *prima facie* on the ground that the cans are washed by soda and other scouring agent.

6. Research

The Central Food Technological Research Institute, Mysore, has recently taken up a research project on the preparation of Murrabbas. The results already achieved have shown that the Murrabbas are not a good source

of Vitamin 'C' or of thiamine; the initial fermentation in apple preserve does not help in improving sugar penetration and that there is no correlation between alcohol contents and yeast count. Some papers have also been published but more detailed work needs to be done on the specific problems which are being confronted by the Murrabba Industry. The research work when published, often have not effectively produced results in actual practice. It is, therefore, suggested that whatever results are obtained in the laboratories should be put to field trial by deputing the research worker concerned in direct touch with the manufacturers who then could put into effect his findings on a commercial scale. The Sub-Committee was given to understand by some manufacturers that they were willing to co-operate with the authorities in this direction. This would not only encourage the manufacturers to adopt new methods but it would also irradicate unsympathetic attitude towards anything which introduces a change.

Another important consideration in respect of research is that the only Central Laboratory on Food Technology is at present situated at Mysore where most of fruits processed by the Industry is not available in quantities sufficient to conduct research work. The Sub-Committee discussed the problem of establishment of a laboratory in the North at great length and with the State Governments of Delhi and Uttar Pradesh. The Sub-Committee visited the Directorate of Fruit Utilization and its laboratory and factory at Lucknow. There is good scope for undertaking an immediate research programme by this laboratory which is fairly well equipped to do the work on commercial processing as well as scientific research. The Sub-Committee is convinced that the needs of the Industry can only be served by operating a regional work laboratory which would not only attend to the long and short term programme of research but associate in attending to training of personnel or manufacturers. The Sub-Committee recommends that a regional laboratory should be established immediately to cater the needs of the Industry. In making this recommendation, the Sub-Committee had kept in view the present financial difficulties of establishing such a laboratory and hence a request was made to various associations of the Murrabba manufacturers at the centres which the Sub-Committee visited to contribute some amount towards the establishment of a laboratory. The Sub-Committee has received a promise from these organizations to offer some help in form of contribution.

"Establishment and working of laboratory on a moderate scale would mean an expenditure of about Rs. 50,000 a year if the research unit with necessary equipment is housed in any existing laboratory like the Indian Agriculture Research Institute, Delhi, or Sri Ram Institute, Delhi, or the laboratory of the Directorate of Fruit Utilization at Lucknow, U. P." The Sub-Committee suggests that a suitable provision should be obtained either from various research organizations or from the Ministry of Agriculture which is in charge of this Industry.

Some of the problems which require immediate attention are enumerated below:—

PROBLEMS OF INDIAN PRESERVES

1. *Study of lack of uniformity in the consistency of preserved fruit with special reference to penetration of sugar.*

(a) Effect of pre-treatments of fruits like mechanical puncturing (before and after blanching), freezing, cold storage, steaming and blanching in different electrolytes (acids, alkalis and salts) and further study of effect of pre-treatments on the microbial load.

(b) Effect of methods of concentration such as conventional slow process, slow process at 60° C. vacuum concentration and concentration after layering with sugar (present practice).

(c) Effect of nature of sugar like glucose, fructose, and sucrose in different proportions. Use of invert syrup and commercial corn syrups.

(d) Effect of controlled fermentation at an intermediate stage and determination of suitable stage from those ranging from 30° to 60° Brix stages.

In this study analytical data on yeast count alcohol, Co^2 and possible formation of Vitamin B_1 , riboflavin and nicotinic acid to be collected.

2. *Fermentation of preserves during storage.*

(a) Survey of microbial loads in factories during all the stages of preserve manufacture.

(b) Determination of processing conditions by heat penetration trials in closed containers.

(c) Study of loss of vacuum, analysis of gases formed, degree of swelling counts of yeast, mould and bacteria, comparative study in packs made from initially fermented and unfermented preserves.

(d) Types of cans to be used, *i.e.*, plain, lacquered and kerosene oil tins.

(e) Open pack of preserves—study of methods to check fermentation, *e.g.*, chemical preservatives, suitable heat treatment before packing, suitable Brix of finished product and use of suitable closures.

3. *Darkening of preserves during storage.*

Study of different types of containers, storage temperatures and anti-oxidants, and packing in air, vacuum nitrogen and Co^2 Role of metallic contamination in darkening.

4. *Study of sugar requirements for preserves and candies.*

5. *Nutritive value of Indian preserves.*

6. *Study of changes in polyphenols during preparation and storages of preserves.*

7. *Research on medicinal values of murrabbas has already been suggested.*

7. Finance

Taking into account the production and correlating with the amount of investment, over head cost and the early turnover, the Sub-Committee after prolonged study and discussion have reasons to accept the net returns in this industry at 12½ per cent on the investment in the Industry. The Sub-Committee during examination obtained figures which varied from as low as 2 to 3 per cent to as much as 18 to 20 per cent. While suggesting the figure of 12½ per cent, the Sub-Committee has kept in view the raw material purchases, the sales which are effected either on wholesale rates or at the retail rates. In certain instances it may be true that the manufacturers did not get adequate returns but this in view of the Sub-Committee was due to inadequate knowledge of costing, and also due to the fact that most of the manufacturers effect their sales at varying prices. The prices of the various commodities are not uniform throughout the year and at times they fluctuate considerably due to very keen competition between the manufacturers of a particular centre and also between different centres of production. It is also reported that often the prices

of the commodities are brought down by reducing the quantity of fruit in the finished product by supplying higher quantity of syrups. These practices are undoubtedly not healthy. It would be better if the Industry employ a definite system of costing to ascertain the implications of various factors and also to check on the amount of wastage which are incurred from the stage of purchase of raw material to the final sale of the product. Such a costing would reveal that the manufacturers are not in a position to bring down the prices of the product below a certain minimum. The Association of the Industry would do well in enforcing a code of conduct by which no manufacturer would sell the product below the minimum level of price.

The Sub-Committee observed that one of the reasons for the slow progress made by this industry was due to the fact that there has been no ploughing back into the industry from the return obtained by the manufacturers over all these years. It was also felt that the Industry was capable through its own resources to effect the minimum changes required for lifting this industry from the existing state to a better organized and equipped industry to handle products which are meant for human consumption. The suggestions which the Sub-Committee have made for the introduction of better hygienic and sanitary conditions in production equipment for handling and packing, adequate labour employment of trained personnel, more supervision, etc. are in the opinion of the Sub-Committee within the means of most of the manufacturers.

The financial assistance offered by the various State Agencies through either small scale industry schemes and other developmental programmes now being put into operation are not being utilised by the Industry due to certain misgivings and prejudices. The Industry would do well in making use of their opportunities offered by the various agencies as otherwise they are likely to remain under-developed. The Industry can get further assistance with more favourable terms if they can form into co-operatives and at least pool certain common items of services from a co-operative enterprise. Such a system of manufacture would keep the individuality of the manufacturer but at the same time would enable individual members to utilise common services like steam, water, refuse clearance, transport, etc. Attempt towards this direction should be specifically made in Delhi as under the existing plan of establishment of "industrial estate" the Murrabba Industry has an opportunity of shifting to a more spacious and healthy surrounding. The Sub-Committee recommends that considering the state of the Industry the aid to this Industry in so far as shifting of the units are concerned should be considered from the most sympathetic point of view and as much liberal assistance as possible should be given.

8. Demand and prospects

As already stated earlier, the consumption of most of the Murrabba is confined to their use for medicine. There are certain items, however, which are processed into crystallised fruit and peels etc., which are finding new markets. These products are extensively used in preparation of cakes, pastries, ice-cream as well as for serving as desserts. The demand of the Murrabbas is all over India but certain States like Delhi, Punjab, Uttar Pradesh, Rajasthan and Bihar are the major consuming centres. The sales of the product, in most of the cases are on credit or consignment basis. The retailers buy the requirements in 4 gallon tins and sell from this container over a period of few days because each customer buys only a small quantity of product and in many cases a piece to serve the purpose of medicine. The demand generally could be stated to be confined to middle and lower middle class and in the

rural areas. The demand has not yet been created from the point of view of nutritional benefits of the products. There is, therefore, much work needed in effective expansion of markets for the Industry.

The prospects of the Industry are very good. It can be further enhanced considerably if the Industry improves its quality and conditions of manufacture as well as its form of distribution of the product to the consumers. It is possible that in the initial stage some of the markets may diminish but once a new pattern of development is put into operation there is bound to be a considerably expansion of the market. The Industry is capable of utilising not only the horticultural wealth but also has a unique role of offering the utilisation of forest wealth in form of amla, harad, bail, etc. The Industry has been playing an important part in curing the ailments of human beings and in future with advance technique and new research may show new avenues of usages. The future of the Industry is closely linked in educating the consumers to ways of how products could be introduced in the daily diet. Attempts have been made in this direction by greater utilisation of crystallised fruits in cakes, pastries, ice-cream, fruit cocktail, desserts etc. The new demand not only lies in increased consumption within the country but also in foreign countries where many of the products could find a substantial market on the basis of standard quality and uniform and attractive packing.

“During the course of the enquiry, it was brought to the notice of the Sub-Committee that a substantial market exists for the Murrabbas in West Pakistan. Unfortunately, due to the import policy restrictions of the West Pakistan Government, Murrabbas are not being permitted to be exported from India. The use of Murrabbas, as already indicated in the *Unani* system of medicine, naturally creates demand for the products of this Industry. It will be a substantial help to this Industry if the Government of India could request the Government of Pakistan to allow export of Murrabbas from India. The Sub-Committee recommends strongly that such an approach should be immediately made, and in our trade agreement with Pakistan, a specific mention may be made for permitting export of this commodity. This would further expand the export market to other West Asian Countries.”

9. Note of dissent by members of the Sub-Committee

(a) NOTE OF SHRI MADAN LAL

It is my painful duty to place on record my note of dissent in respect of certain recommendations made by the Sub-Committee, of which, I have the honour to be a member.

I do not subscribe to the views of the Committee for making ‘Hermetical sealing’ of preserves as a mandatory provision of the Fruit Products Order. It is my considered opinion as the result of my own experience in the Industry for the last 25 years, result of my close relations maintained with the Industry in the capacity of the Secretary of the Delhi Fruit Products Manufacturers’ Association and also as a result of my close and serious examination of this Industry during the tour of the Committee. I consider that it is not only unnecessary but will not fulfil any object in promoting the industry. It will be economically strangulating the existing Industry. The Indian preserves thrive on the patronage of very poor class of people and if we make our products beyond the reach of these consumers, we might as well voluntarily declare the liquidation of the present Cottage Industry.

Packing preserves in hermetically sealed tins should be optional and voluntary. The Industry may be advised to gradually switch on to it and in no way it should be made compulsory. Even in the most of the advanced countries, packing of preserves in hermetically sealed tins is not obligatory under law.

It is likely that the above recommendation if not accepted, the Industry of Fruit Preserves would permeate into the hands of *Ayurvedic Vaid*s and *Unani Hakeems* who would manufacture these items on small scale and undertake its dispensing on their own without packing in tins. In other words, I foresee that the introduction of hermetically sealing on compulsory basis would only result in complete close of the existing units of manufacturing.

From the statistics given in the Report regarding the financial position of each firm engaged in the manufacture of fruit preservation, it is pointed out that the majority of the firms are very small and would be ill-equipped both technically and financially to adopt the measure of hermetically sealing as recommended by the Committee.

It is hoped that the Central Advisory Committee while considering the report of Sub-Committee may take a very sympathetic and realistic consideration of my note of dissent which has been actuated by the realistic conditions prevailing in the Industry.

I propose that before any step is taken in this direction, a programme of research be laid down to standardise the manufacture of preserves and its mode of packing. To my mind this is of utmost importance, and if this Sub-Committee is not able to impress upon the authorities to fulfil the above immediate need of research, it would be failing in its study.

MADAN LAL,

Dated: 30th October, 1956.

Member of the Preserve Sub-Committee.

(b) NOTE OF SHRI M. L. AROURA

While agreeing in principle for introducing hermetical sealed containers for Murrabba instead of being sold loose as the present practice is, I have to make the following observations:—

(1) This practice of selling Murrabbas loose is prevalent for the last hundreds of year and there has been no complaint about its quality. It has been acceptable to the consumers.

(2) By introducing hermetically sealed containers for Murrabba, the prices of Murrabba will naturally go up by 100% in small packing and will become beyond the reach of the poor masses of the country.

(3) The medicinal value of the Murrabba has been admitted in the report and a poor sufferer seeking *Unani* or *Vedic* treatment, since he cannot afford Allopathic treatment, can now easily procure his requirements whereas it will be difficult for him to go in for a tin container which will be 100% costlier and might not be within his reach. For example, if a poor man goes for a small container he is required to pay double the price which he is paying at the moment.

(4) At present Murrabba is common among the lower middle class people and an effort should be made to popularize Murrabba among the poor class people of the country, by bringing down its prices still at a lower level. But by introducing hermetically sealed containers the prices will further go up making it beyond the reach of the masses, thereby indirectly affecting the *Unani* and *Vedic* treatment in the country.

(5) There is already shortage of tin-plate in this country at present and the manufacturers of Fruit Products are already experiencing difficulties on this account, but if hermetically sealed cans are introduced for Murrabba, I do not understand how it will be possible to meet the demands of cans for Murrabba worth Rs. 33 lacs which is manufactured in the country.

(6) The people in this country are already prejudiced against tinned fruits and it will take long time for common man to understand the advantages of canned and bottled fruits. It will thus take years for a common man to become canned Murrabba minded.

(7) If this scheme is introduced at this stage, innumerable problems will crop up for the manufacturers. They will have to invest large sums of money on machinery, cans and bottles and other necessities and they will have to engage technical hands to operate the machinery. The Cottage Industry is likely to suffer as they will have to employ additional staff for the implementation of this new system. In my opinion the result will be that 50% of the small scale manufacturers who have been doing this business since time immemorial will have to close down their business and this business might be taken over by the capitalists. This would mean starvation for the small scale manufacturers of Murrabba, and defeat the idea of the Government of India to encourage the Cottage Industries in the Second Five Year Plan.

(8) Before introducing hermetically sealed containers, it is desirable that some researches should be carried out with a view to find out as to what type of particular container will be suitable for preservation of a particular type of Murrabba, in order to retain its quality for a longer period. Moreover, hermetically sealed bottles suitable for packing Murrabba are not at present manufactured in this country. Arrangements should be made to get such type of bottles manufactured in India at lower prices.

The present need of the hour is to educate the personnel engaged in the Murrabba Industry so that the product should conform to the specifications laid down in the Fruit Products Order, 1955. I suggest that three regional research centres should immediately be opened at Delhi, Amritsar and Lucknow to carry out the researches in Murrabbas, and solve the present difficulties of the manufacturers.

In view of the above consideration, I suggest that hermetically sealed containers should be introduced gradually after 10 years (1966). It should be enforced by legislation if necessary because by that time it is hoped that economic conditions of the country will improve and *per capita* income would increase. In this manner the outlook will also be changed and the people might become canned and bottled Murrabba minded by that time.

M. L. AROURA,

Member of the Preserve Sub-Committee.

10. Summary

Introduction—

(1) The Sub-Committee of the Central Fruit Products Advisory Committee was constituted to enquire into the Murrabba Industry in India.

History—

(2) The history of the Murrabba Industry is linked with the indigenous system of medicines particularly the *Unani* system of medicines.

Manufacture—

(3) The process of manufacture of Murrabbas has undergone changes from the original with a view to improve the appearance and taste of the product and to increase the production by quickening the process of manufacture. In achieving these objectives, the manufacturers have adopted heavier blanching, use of chemicals for bleaching, use of firming agents, removal of more soluble solids to remove astringency, use of dried sugar in stead of syrup and a system of semi-finishing of the product for quickening the pace of manufacture.

(4) The Sub-Committee went into the question of the existing specifications under the Fruit Products Order for preserves and did not find it advisable to change the specifications.

Status—

(5) The production of Murrabbas in India is estimated at 81,900 maunds (about 3,000 tons) valued at Rs. 33 lacs.

(6) The estimated requirements of fruits by the Industry is 54,600 maunds and sugar 65,520 maunds valued at Rs. 5,46,000 and Rs. 20,31,000 respectively.

(7) The preserves industry can be said to be mainly in the hands of small propriety and partnership concerns.

(8) The processing areas of factories in most of the cases was inadequate compared to the amount of production.

(9) The manufacturers did not have adequate quantity of water supply required under the Fruit Products Order, 1955. It is recommended that the factories should arrange better facilities for storage of water and should arrange with the local authorities for larger supplies.

(10) The average number of working days in Murrabba factories in India are 248.

(11) The general conditions of the factories left much to be desired. This it was found was due to existing methods of handling, and processing particularly unsystematic flow of material from process to process, concentrated processing activities in a limited space around *Bhatkies* and shortage of labour.

(12) In important centres of production the existing units are situated in thickly populated areas. The conditions of the factories cannot be improved. The Sub-Committee, therefore, recommends that all possible assistance should be given to the manufacturers for shifting of the units to the healthier surroundings. The Industry cannot be developed unless a concentrated move in this direction is made by all concerned.

Quality—

(13) The results of analysis of Murrabba samples have revealed that as many as 50% of the samples did not come up to the specifications prescribed under the Fruit Products Order. This confirms the unsatisfactory conditions of the factories and their working.

(14) If the Industry has to be developed on the right line it was the considered opinion of the Sub-Committee that steps should be taken to introduce hermetic packing of all Murrabbas. Two members of the Sub-Committee however have given note of dissent in this connection. The majority of members of the Sub-Committee recommends that the entire Murrabba Industry should cease to pack Murrabba in any packing other than the hermetic packing by 1st April, 1958.

(15) The Sub-Committee was given to understand that a scheme to subsidize the scheme of open top cans is likely to be accepted by Government. It was thought that this would easily enable the Murrabba manufacturers to change to the new mode of packing.

(16) The Sub-Committee also recommends introduction of suitable glass containers for packing.

(17) The manufacturers should introduce check on quality by checking the quality of what they produce and what they sell.

Research—

(18) The Sub-Committee felt that results achieved in the laboratories should be put to field trial.

(19) It is recommended that a regional laboratory should be established immediately at any existing laboratories at Delhi like the Indian Agricultural Research Institute or Sri Ram Institute, Delhi or The Laboratory of Fruit Utilization of Lucknow, U. P. In this connection the Sub-Committee received a promise from the manufacturers to offer some financial help.

(20) Some problems of the preservation industry are listed and it is recommended that immediate work on those lines should be taken up.

Finance—

(21) The Sub-Committee recommends that the Industry should employ a definite system of costing to ascertain the implications of various factors.

(22) The Sub-Committee observed that one of the reasons of slow progress made by this industry was due to the fact that there has been no ploughing back by the Industry from the returns obtained by the manufacturers.

(23) Suggestions made in respect of better hygienic and sanitary conditions in production, equipment for handling and packing, adequate labour, employment of trained personnel, more supervision etc., are in the opinion of the Sub-Committee within the means of most of the manufacturers and therefore should be put into effect.

(24) The Industry would do well in making use of the financial assistance being offered by the various State Agencies.

(25) The Industry can get more favourable terms for assistance if organized into co-operatives and at least pool certain common items of services from the co-operative enterprise. Attempt in this direction should specifically be made in Delhi keeping in view of the plan of establishment of "industrial estate" in the city.

(26) The Sub-Committee recommends that considering the stage of the Industry and aid to the Industry in so far as shifting of the units are concerned should be considered from the most sympathetic point of view and as much liberal assistance as possible should be given in this regard.

Demand—

(27) The demand for the products of the Industry is confined to middle and lower class and in the rural areas.

(28) The Industry is capable of utilising not only the horticultural wealth but also has a unique role of offering the utilization of forest wealth. The demand can increase if quality and packing improves.

(29) The future of the Industry is closely linked with educating the consumer to ways of how the products could be introduced in daily diet.

(30) There is a considerable scope for expansion of markets in foreign countries for the products of this country. There is a considerable market for Murrabbas in West Pakistan. But due to the existing restrictions on import by the West Pakistan Government hardly any products are being exported. The Sub-Committee recommends strongly that in our trade agreement with Pakistan, specific mention may be made for promoting export of this commodity. This would further expand the markets in West Asian Countries.

We, the members of the Sub-Committee, have the pleasure of submitting a Report on the Fruit and Vegetable Murrabba Industry in India, with the minutes of dissent by Sarvashri Madan Lal and M. L. Aroura, pertaining to the subject matter dealt with on page 14.

We record our appreciation to the co-operation given by the members of the Industry and other individuals who assisted us and who gave their valuable advice and suggestions during the enquiry.

1. Dr. Girdhari Lal, CHAIRMAN.
2. Shri N. S. Pochkhanawala, MEMBER.
3. Shri Madan Lal, MEMBER.
4. Shri Manohar Lal Aroura, MEMBER.
5. Shri P. H. Bhatt, CONVENER.

NEW DELHI:

Dated, the 29th October, 1956.

To

The Chairman,
Central Fruit Products Advisory Committee,
New Delhi.

(ii)
List of priced publications (contd.)

1	2	3	4	
*20	AMA 11	Report on the Marketing of Grapes in India and Burma	Rs. 1-4-0	
*21	AMA 18	Report on the Marketing of Coffee in India and Burma	Rs. 1-4-0	
*22	AMA 21	Report on the Marketing of Potatoes in India and Burma	Rs. 1-4-0	
*23	AMA 22	Report on the Marketing of Milk in India and Burma	Rs. 1-4-0	
*24	AMA 25	Preliminary Guide to Indian Fish, Fisheries, Methods of Fishing and Curing	Rs. 1-0-0	
	25	AMA 27	Abridged edition of the Report on the Marketing of Eggs in India and Burma in <i>Urdu</i>	As. 0-8-0
	26	AMA 26	Abridged edition of the Report on the Marketing of Eggs in India and Burma in <i>Hindi</i>	As. 0-8-0
*27	AMA 20	Report on the Marketing of Rice in India and Burma	Rs. 1-4-0	
*28	AMA 24	Report on the Marketing of Groundnuts in India and Burma	Rs. 1-4-0	
*29	AMA 7.40	Annual Report of the Agricultural Marketing Adviser and Summarised Reports of Senior Marketing Officers in Provinces and certain States for the year ending 31st December, 1940	Rs. 1-4-0	
	30	AMA 28	Abridged edition of the Report on the Marketing of Potatoes in India and Burma in English	As. 0-8-0
	31	AMA 29	Abridged edition of the Report on the Marketing of Grapes in India and Burma in English	As. 0-8-0
*32	AMA 30	Abridged edition of the Report on the Marketing of Milk in India and Burma in English	As. 0-8-0	
*33	AMA 39	Hand-book on the quality of Indian Wool	As. 0-8-0	
*34	AMA 38	Abridged edition of the Report on the Marketing of Tobacco in India and Burma in English	As. 0-8-0	
*35	AMA 31	Abridged edition of the Report on the Marketing of Groundnuts in India and Burma in English	As. 0-8-0	
*36	AMA 41	Report on the Marketing of Hides in India and Burma	Rs. 1-4-0	
*37	AMA 35	Abridged edition of the Report on the Marketing of Rice in India and Burma in English	As. 0-8-0	
*38	AMA 34	Instructions regarding the Grading and Marketing of Ghee, in connection with Agricultural Produce (Grading and Marking) (Ghee) Rules, 1938	As. 0-4-0	
*39	AMA 23	Report on the Marketing of Sugar in India and Burma	Rs. 1-4-0	
*40	AMA 37	Report on the Marketing of Skins in India and Burma	Rs. 1-4-0	
*41	AMA 22.2	Second edition of the Report on the Marketing of Milk in India and Burma	Rs. 1-4-0	
*42	AMA 36	Report on the Co-operative Marketing of Agricultural Produce in India	Rs. 1-4-0	

(Continued from the inside outer title cover.)

List of priced publications (*contd.*)

ZUUS-U

1	2	3	4
*43	AMA 42	Report on the Marketing of Citrus Fruits in India	Rs. 1-4-0
*44	AMA 33	Report on the Marketing of Lac in India	Rs. 1-4-0
*45	AMA 40	Report on Fairs, Markets and Produce Exchanges in India	Rs. 1-4-0
*46	AMA 32	Report on the Marketing of Coconuts, and Coconuts Products in India	Rs. 1-4-0
*47	AMA 45	Report on the Marketing of Cashewnuts in India	Rs. 1-4-0
*48	AMA 43	Report on the Marketing of Gram in India	Rs. 1-4-0
*49	AMA 47	Report on the Marketing of Bananas in India	Rs. 1-4-0
*50	AMA 48	Report on the Marketing of Sheep and Goats in India	Rs. 1-4-0
*51	AMA 44	Report on the Marketing of Barley in India	Rs. 1-4-0
*52	AMA 46	Report on the Marketing of Fish in India	Rs. 1-4-0
*53	AMA 51	Report on the Marketing of Cattle in India	Rs. 1-4-0
*54	AMA 52	Report on the Marketing of Wool and Hair in India	Rs. 1-4-0
*55	AMA 53	Report on the Marketing of Castorseed in India	Rs. 1-4-0
	56	AMA 57 Agricultural Produce (Grading and Marking) Act, 1937 with Rules made prior to 31st December, 1946	Rs. 1-4-0
*57	AMA 50	Report on the Marketing of Ghee and other Milk Products in India	Rs. 3-0-0
	58	AMA 55 Supplement to the Report on the Marketing of Wheat in India	Rs. 1-4-0
	59	AMA 49 Report on the Marketing of Rapeseed and Mustard in India	Rs. 2-0-0
	60	AMA 56 Report on the Marketing of Cardamom in India	Rs. 1-2-0
	61	AMA 59 Bulletin on the Marketing of Sann Hemp in India	Rs. 1-8-0
	62	AMA 54 Bulletin on the Marketing of some Important Stone, Pome and Small Fruits and Pine-Apples in India	Rs. 1-4-0
	63	AMA 58 Report on the Marketing of Arecanuts in India	Rs. 1-4-0
	64	AMA 60 Report on the Marketing of Milk in the Indian Union	Rs. 3-8-0
	65	AMA 46-II Report on the Marketing of Fish in the Indian Union (Second edition)	Rs. 5-10-0
	66	AMA 25-II Preliminary Guide to Indian Fish, Fisheries, Methods of Fishing and Curing (Revised edition)	Rs. 4-4-0
	67	AMA 62 Abridged edition of the Report on the Marketing of Milk in the Indian Union in <i>Hindi</i>	Rs. 1-2-0
	68	AMA 61.48 Annual Report of the Directorate of Marketing and Inspection for the year ending 31st December, 1948	Rs. 1-4-0
	69	AMA 64 Atlas on Livestock and Livestock Products	Rs. 8-14-0
	70	AMA 66 Instructions for grading Tobacco	Rs. 1-2-0
	71	AMA 69 Report on the Marketing of Hides in India (Second edition)	Rs. 4-8-0

List of priced publications (contd.)

(1)	(2)	(3)	(4)
74	AMA 70	Report on the Marketing of Maize and Millets in India	Rs. 5-8-0
75	AMA 74	Report on the Marketing of Rice in India (Second edition)	Rs. 8-0-0
76	AMA 75	Report on the Marketing of Tobacco in India (Second edition)	Rs. 7-8-0
78	AMA 77	Methods of Sampling and Testing Vegetable Oils and Fats under Agmark.	Rs. 2-4-0
79	AMA 79	Report on the Marketing of Meat in India	Rs. 5-12-0
	AMA 81	Report on the Marketing of Skins in India (Revised edition)	Rs. 5-8-0
	AMA 85	Quality of ghee sold loose in urban markets in India—Ghee Series I	As. 0-4-0.
	AMA 88	Studies in Ghee-Series II	As. 0-3-0.
81	AMA 80	Methods of Sampling and Testing Butter Fat (Ghee, Butter) under Agmark	Rs. 2-6-0.
82	AMA 82	Bulletin on the Marketing of Palmyra Fibres in India	Rs. 1-10-0.
	AMA 87	Report on the Marketing of Potatoes in India	Rs. 3-0-0
	AMA 84	Report on the Marketing of Cattle in India	Rs. 3-6-0
84	AMA 86	Report on the Marketing of Poultry in India.	Rs. 3-8-0
	AMA 89	Brochure on the Marketing of Henna in India Report on the Marketing of Chillies in India (Under print).	As. 0-14-0 or 1sh 3d.
87	AMA 90.54	Report on the Analysis of Fruit and Vegetable Products in India (1953-54)	Rs. 2-10-0.
	AMA 90	Report on the Marketing of Tapioca in India Report on the Marketing of Linseed in India (Under print).	Rs. 1-10-0
	AMA 94.1	Report on the Regulated Markets in India— Vol. I. Legislation	Rs. 2-4-0
	AMA 97	Report of An Ad Hoc Survey of Cold Storage for Fruits and Vegetables in Consuming Centres in India (1955) Report on the Marketing of Mangoes in India (Under print)	As. 0-14-0
BROCHURE SERIES—			
		Brochure Series No. 1 Brochure on the Marketing of Fish in India	(Unpriced).
		Brochure Series No. 2 Brochure on the Marketing of Wool in India	Do.
		Brochure Series No. 3 Brochure on the Marketing of Milk in the Indian Union	Do.
		Brochure Series No. 4 Brochure on the Marketing of Isubgol in India	Do.
AMA 63		Brochure Series No. 5 Brochure on the Marketing of Kapok and Akund Floss in India	Rs. 1-8-0 or 2s. 3d
AMA 65		Brochure Series No. 6 Brochure on the Marketing of Groundnuts in India	Do.

(v)
List of priced publications (*concl.*)

(1)	(2)	(3)	(4)
72	AMA 68	Report on the Marketing of Sesamum and Nigerseed in India	Rs. 3-8-0
73	AMA 73	Report on the Marketing of Groundnuts in India (Second edition)	Rs. 7-8-0
	AMA 72	Brochure Series No. 7 Brochure on the Marketing of Bristles in India	Rs. 3-12-0 or 6s.
	AMA 71	Brochure Series No. 8 Brochure on the Marketing of Fish in India in <i>Hindi</i>	Rs. 1-10-0.
	AMA 76	Brochure Series No. 9 Brochure on the Grading of Tobacco in India	Rs. 2-6-0.

NOTE.—*The Report is out of stock with the Manager of Publications, Civil Lines, Delhi 8.

N.B.—Prices are inclusive of packing and postage (in India). Indenters requiring the above are requested to quote only the symbol and not the title of the publication.

Publications noted above except unpriced brochures can be had from (a) Manager of Publications, Civil Lines, Delhi 8, (b) Book Depot 8, Hastings Street, Calcutta for local cash sale only, and (c) any of the authorised agents for the sale of Government of India publications. The unpriced brochures can be had from the Directorate of Marketing and Inspection, "P"-Block, Raisina Road, New Delhi.

In Europe and America, Public Department (Publication Branch), Office of the High Commissioner for India, India House, Aldwych, London W. C. 2.

(Continued from the inside title cover).