

Clay Refrigerator Runs Without Electricity

REFRIGERATORS available in Sri Lanka are constituted of a small freezing chamber and the main volume of the appliance which is kept several degrees above freezing point. Meats are generally stored in the freezer while vegetables among others are stored in the main part of the refrigerator. The cheapest refrigerator today in Sri Lanka costs about Rs. 4000/- and consumes electricity and/or kerosene.

An Indian engineer Shri N. Ramu has developed a very cheap refrigerator which provides some of the facilities in the more expensive varieties. The refrigerator runs without electricity and costs only about Rs. 100/- and is based on the principle of the cooling effect created by the evaporation of water.

Simple in construction and design, the new refrigerator uses hollow blocks of baked clay available in different lengths from 1½ ft. to 2½ ft. Eight blocks of suitable size are sufficient for a 2.5 cu.ft. capacity box-model refrigerator; for greater capacity the number of these blocks may be increased. The refrigerator can also be made in the shape of an almirah with shelves to store fruits and vegetables. The box-model would cost about Rs. 50/- and the almirah type about Rs. 100/- according to Shri Ramu.

The refrigerator can be constructed by any mason by mounting the blocks on a concrete platform and fitting an airtight insulated door on one side. Water, the only refrigerating agent used, is filled in the hollow blocks, which are interconnected by a suitable arrangement. The water is drained out when needed through a spout provided at the bottom of the refrigerator. The top of the box is closed by a thin reinforced concrete slab with small holes, which are essential for effective functioning of the refrigerator. As water evaporates, the sides of the blocks get cooled and provide refrigeration by convection.

Shri Ramu has found that the temperature inside the box remains between 73° to 75° F. This tem-

perature as well as the required humidity in the refrigerator are almost constantly maintained, irrespective of any change in the room temperature.

Tests conducted with the new refrigerator have shown that vegetables and fruits retain their freshness for a number of days and can be utilized directly for cooking or eating, unlike those preserved in electrical refrigerators which need to be brought to the room temperature before cooking or eating. Fruits like lemons, limes and sweet limes, and vegetables like beetroots and raw bananas retain their texture and freshness for over two weeks. Other vegetables remain fresh for to 3 to 10 days.

The new refrigerator has the distinct advantage of having a very low initial cost in comparison to the conventional refrigerating machine. It entails no running expenditure and can be utilized even at places where there is no electricity. Apart from homes, this type of refrigeration system could be profitably utilized in restaurants, food processing industries, vegetable markets, etc.

Towards a 'White Revolution' Soya Milk

In a previous issue of the Economic Review attention was drawn to the production of milk in the country and the total inadequacy to meet the country's requirements. There we recorded a fall in the production of milk, as well as the rapid decline of the elite milk producing herd in the country. Further, the annual milk production of local cows in the South Asian region not belonging to the elite category is only about 173 kg. compared to 4154 kg. in U.S.A., 3950 kg. in the U.K. and 3902 kg. in New Zealand. With the paucity of milk imported, a supplementary source of milk that is emerging is soya milk.

The basic raw material for soya milk is soya bean. It contains about 40% protein and 20% oil. It is now

being grown extensively in Sri Lanka and processed soya bean could be a very good source of protein. The Indian University, Pantnagar Agricultural University has developed, soya milk as one of its soya products.

Soya milk has a protein content similar to that of milk. It can be mixed with ordinary milk in proportions as high as 50:50. This mixture is almost indistinguishable from cow's milk. Thus, soya milk and ordinary milk can not only co-exist but also supplement each other. As for the nutritive value of soya milk, the data given in the following table speak for themselves:

<i>Nutritive Constituents</i>	<i>Cow's milk</i>	<i>Soya milk</i>
Proteins ...	3.2%	3.2%
Fats ...	4.5%	1.7%
Carbohydrates ...	—	2.0%
Minerals ...	0.7%	0.5%

Though equally nutritive, the production cost of soya milk packed in bottles or sachets comes to only about one-third the cost of cow's milk. Soya milk can be imparted with any flavour or taste. With the addition of 6 to 7 percent sugar, it can be used as a good beverage. The unsweetened milk could also be used in other forms like curd.

Soya milk can be stored for quite a sufficient time. Pasteurized soya milk can be stored for about a week at 5° C. The milk can be kept in bottles, plastic sachets or in bulk containers according to convenience. About 10 litres of soya milk can be prepared from one kilogram of soya grains.

The soya grain has to pass through a number of processes before obtaining soya milk. The various processes involved are cleaning and grading, de-hulling, cotyledon separation, blanching, wet grinding, colloid milling, blending, homogenization, boiling, chilling and packaging.

According to the Pantnagar Agricultural University a plant producing 10,000 litres/day of soya milk can be set up with a capital investment of about Rs. 10 lakhs. The investment could be reduced to only Rs. 1 lakh in case of modern dairies already in existence.

Soya milk is already extensively used in some countries like China and Japan.