GREETINGS

Winnowing the peanut/shell mixture. The mixture is poured into a wheelbarrow – the wind takes the broken shells away.

David Ryan and Segundo Marin Gomez

Today farm produce for processing and sale will be bought and sold several times before reaching the final consumer, especially if it is sold in the capital city or exported.

But trade started as a local exchange or barter of goods and the traders knew, and depended on, each other. Trade only flourished where both partners in the exchange got a good deal. As the consumers become more distant from the producers, so that relationship is lost. Whilst there is legislation to protect the consumer about the quality of the product, how can the producer be assured of a fair deal, especially when their final product may be sold in another country?

FINAL SELLING PRICE

In the UK 15 per cent of the food we buy each week is imported. Many producers do not get a fair share of the final selling price and so poor producers are often subsidising rich consumers. However there is a growing number of consumers who not only want coffee and other foods that taste good but they want the assurance that they are fairly traded. The article on page 3 gives more information on the Fair Trade movement.

In the UK Traidcraft is one of the major fair traders with annual foods sales of $4million. The demand for high quality fairly traded foods is increasing, and Traidcraft needs more producers who can supply groundnuts, dried fruits, snack foods, spices etc. Consumers buying Traidcraft products can be assured that the producers receive a fair price for their product. There is also a long term relationship of partnership and co-operation between the buyer and supplier, and clear benefits to the producer as a result of the purchase. This may include:

- a fair return for labour
- community development
- participation in decision making
- improved working conditions
- access to advance payment
- increased control of added value

Taking peanuts as an example, the first step in adding value is shelling the nuts and the article on page 12 gives information on shelling equipment. The next step may be producing peanut butter…

Traidcraft is about establishing a more just trading system world-wide and focuses on imports from developing countries, but there is a need for fair trading practice at all levels – locally and nationally so that all the efforts put into producing fruit ice-creams in Peru and cereal snacks in Kenya are fairly rewarded.

INFORMATION

In the South, producers working together for solidarity and efficiency have changed long established unfair trading practices. One of the main ways of doing this is having and using information about the market – about what consumers want, quality requirements, packaging and prices. Organizations like Amka in Tanzania, Just Exchange in South Africa and the Fair Trade Programme in the Philippines can provide that alongside enterprise development counselling. Contact them or Traidcraft Exchange in the UK if you want some more information about Fair Trade.

The editors of *Food Chain* are always pleased to receive any articles/letters which may be of interest to other readers. Contributions are welcome in the form of articles of 450 to 1200 words, plus line drawings and photographs where possible.

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Manufacture of fruit-based ice creams

In general, the production of milk-based ice cream is not recommended for small manufacturers due to its associated health and safety implications. Such products require manufacture under strict hygiene conditions, and control checks must be in place throughout the cold chain to the consumer.

However, fruit-based ice creams (often called sherbets), present a far lower public health risk as the high natural acidity of most fruits prevents the growth of food poisoning organisms that can occur in milk-based ice creams.

Recently, a very interesting small-scale system for making such products has been developed in Peru by IT's food processing programme. The machine has generated great interest and more than 100 people have attended short training courses to familiarize themselves with the technology. Several have placed orders for machines. A large proportion of the interest comes from small towns which are not supplied by the large ice cream manufacturers.

Barrie Axtell

Prototype ice-cream machine developed in Peru

THE BASIC MACHINE

The basic machine is built from an old chest deep-freezer. The compressor is removed and placed away from the machine. A stainless steel tank is then constructed to fit into the freezer, (currently fibreglass is being examined as a lower-cost option). A copper coil is then connected to the compressor and run around the walls of the tank. The coil must be coated with several coats of varnish to prevent corrosion. The tank is then filled with a very strong brine solution. When refrigerant is circulated, the brine bath may be cooled to a temperature of minus 15°C. A five-litre stainless steel bowl, (which is rotated by an overhead motor) is suspended in the cold brine tank.

BATCH PREPARATION

After washing, the selected fruit is peeled, chopped and liquidized in a blender. It should then, if necessary, be sieved. The ice cream base (skim milk powder, sugar, stabilizer, vegetable fat) is then made up with cooled boiled water (the use of boiled water is essential for consumer safety).

The mix is then placed in the machine and beaten by holding a stainless steel paddle in the mix in such a way as to beat in the maximum amount of air. This is almost impossible to describe but must be learnt by experience. After about eight-minutes the mixture begins to freeze and the machine is stopped. The 'ice cream' is then spooned into plastic pots and placed in a deep freeze, ready for sale. This system is able to make almost 10 litres of ice cream an hour.

Raw materials
⇓
Batch preparation
⇓
Pasteurize
⇓
Freeze and beat
⇓
Pack
⇓
Store

Experimental recipes from Peru

Ingredients	*Recipe 1 Sour sop*	*Recipe 2 Passionfruit*	*Recipe 3 Sugar apple*	*Recipe 4 Melon and passionfruit*
Skim milk powder	340.5	75.0	340.5	75.0
Sugar	480.0	211.0	480.0	210.0
Stablizer	–	6.0	–	6.0
Vegetable fat	143.0	–	143.0	–
Carboxy-methyl-cellulose	10.5		10.5	
Water	2026.0	789.0	2026.0	–
Fruit	1418.0	360.0	1200.0	600.0 Melon +789.0 P'fruit
Volume of batch	4418.0	1441.0	4200.0	1680.0
Final yield (litres)	4.9	2.0	4.6	2.0

Simple methods for quality control

As a new feature in *Food Chain*, we shall regularly try to include a simple method of quality control. The methods that will be included all have the following characteristics:

- They are relatively simple to use
- They have sufficient accuracy for quality control
- They do not require sophisticated or expensive equipment
- They do not require a high level of skill
- They are sufficiently inexpensive that they may be used regularly by small food businesses.

It should be noted that most of the methods will be comparative and not absolute methods. In other words the results can be compared with other results using the same method but they can not be compared to results found using different methods. For most purposes this is acceptable for routine quality control but it should be emphasized that careful attention is needed to ensure that exactly the same procedure is used every time.

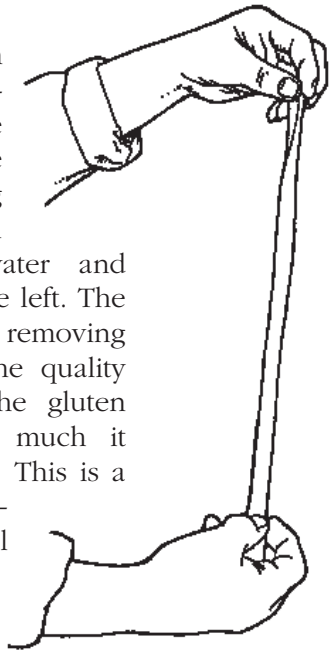
To start the series, routine quality control methods used in bakeries will be described. If readers who have experience of operating a small bakery would like to contribute their own simple methods, we would be pleased to print those that will have widespread interest.

GLUTEN MEASUREMENT

Small-scale bakers do not normally have facilities for flour analysis and must rely on information supplied by the miller. However, useful information can be obtained from simple tests which are described in forthcoming issues (flour infestation, sieving tests, filth test, water absorption measurement and moisture content). In this issue we focus on gluten measurement.

It is important that a baker buys the correct type of flour. For breadmaking it should be 'strong' (that is, made from hard wheats having a medium protein content), have high protein and water absorption levels and a good colour. For other products 'weak' soft wheat flours are normally used. These are lower in gluten and are therefore weaker (the dough extends more) than hard wheats.

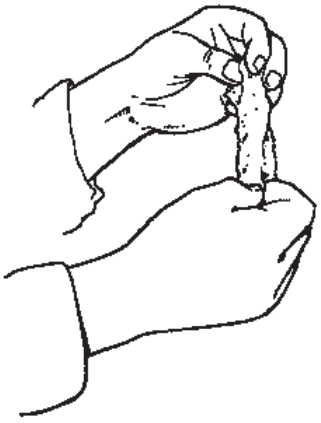
Gluten is the protein which gives the unique elastic properties to bread dough and some other baked products. It can be measured by simply washing out the starch from a small ball of dough under running water and remaining gluten proteins will be left. The quantity can be measured by removing excess water and weighing. The quality can be assessed by pulling the gluten piece apart and noting how much it stretches and its breaking point. This is a quick test which with experience, provides much useful information to the baker.



Weak

METHOD

1. Weigh 10g of flour and place in a basin.
2. Add 6ml of water to the basin, (5ml will be sufficient for weak flour).
3. Using a spatula, mix the flour and water into a dough. Form the dough into a round ball by rolling between the palms of the hands.
4. Replace the dough in the basin and cover it with water. Leave for a time, at least 10 minutes, preferably 45-60 minutes.
5. Holding the dough ball in one hand under cold running water, wash out the starch. Squeeze the dough frequently between the fingers and the palm to help the process.
6. When all the starch has been removed the wash water will run clear and the remaining gluten will be free from lumps.
7. Remove the excess water with blotting paper.
8. Weigh the wet gluten and record this as a percentage of the flour weight.
9. The gluten may be dried in an oven at 103°C to determine dry gluten.



Strong

The gluten obtained at step 7 may be physically examined for strength and elastic properties by pulling it apart.

Herbs that cure

For more than ten years the Centre for Support to Small Farmers, CAPA, has been working to revive existing knowledge and promote the use of medicinal plants in collaboration with small farmers in the Rio Grande do Sul, Brazil. The Community Pharmacy Programme is the fruit of this initiative, in which 18 groups are directly assisted by CAPA and 24 groups are monitored through assistance agreements signed between CAPA, public and farmers' organizations, covering ten municipalities in all. Rita Surita, an agronomist with CAPA, writes about the work of the programme.

The programme has been developed in stages, starting with surveys to pinpoint the main health problems in the area. Next, known medicinal plants in the region were identified. At this stage information and seedlings of plants were exchanged between the groups.

After reviving and developing local knowledge, the process of setting up local dispensaries started. These began making up medicines based on medicinal plants and are now stocked with tinctures, cough syrups, creams, wines, and dried herbs for preparing teas. The dispensaries are run by their own teams with specially trained female health workers responsible for dispensing the medicines. Typically it takes one or two years to set up a fully operational dispensary.

The programme has not been without problems. Two particularly serious ones have been confusion over the correct identification of different plants, and the fact that one plant may have widespread use for different health problems. In order to overcome this problem CAPA has developed one of its most important tools, the herbarium album. This album contains dried specimens of the all the plants with which the group is working. It is prepared with the full participation of members, in both research and specimen mounting. The album is a reliable source of information and is used as a reminder of the appearance and correct use of each species.

The Association of Fieldworkers community pharmacy at São Lourenço do Sul

CAPA/Rita Surita

PHARMACY NURSERIES

Another challenge is the conservation of species of medicinal value. The replacement of household remedies by medicine bought in drug-stores (many of them produced from active ingredients extracted from plants) and the harmful effects of current agricultural practices on the habitat of these plants, are making medicinal herbs more and more rare. One of the objectives of the programme is to set up pharmacy nurseries for cultivating the plants to be used. Besides supplying the community pharmacy, the nurseries are also involved in the identification and study of medicinal plants. The establishment and management of these nurseries requires considerable knowledge and keen powers of observation from those responsible. The training work developed by CAPA covers every aspect of the cultivation and use of medicinal species, and the procedures required to ensure that extraction and use for medicine production does not threaten a wild species.

FAMILY HEALTH

Most pharmacy nurseries are run as a community activity and are able to supply a wide range of medicinal species, clearly helpful both for the operation of dispensaries and for training purposes. Not all groups involved in the programme have chosen to set up a collective pharmacy nursery, as its maintenance and expansion with new species involves considerable work and a good community organization structure. In these cases, the

CAPA/Rita Surita

Live reference crops at the medicinal plants project nursery at São Lourenço do Sul.

members of the groups cultivate the medicinal plants on their own individual family plots.

The pharmacy nursery programme has now spread to a number of municipal schools in order to develop a knowledge of the subject amongst children. Some farmers from the community pharmacy groups recall with satisfaction that their children are now taking herb seedlings to school. This pilot project currently involves four schools in the municipality, with a total of 664 children.

The considerable investment of time and effort made to date is now paying off, with medicinal plants increasingly viewed more seriously. For example, recent main activities have been training courses, staged by CAPA but with important support from the Federal Universities of Pelotas and Santa Maria. These courses have trained 28 female health workers, who are today leading this initiative with the farmers' organizations and the municipal bodies.

The Community Pharmacy Programme is, therefore, an opportunity for the active participation of the female population of rural area and a response to an ever present concern: the health of the family.

For further information contact Monica Debuche de Paiva, Documentation Centre, AS-PTA Nacional, Rua da Candelaria 9, 6 andar Centro 20091-020, Rio de Janeiro RJ, Brazil

CAPA is a non-governmental organization connected to the Evangelical Church of Lutheran Confession in Brazil. It was created in 1978 and works in agriculture, health and community organization. Its work with small-scale farmers looks for creative and self-sufficient solutions to problems, and the domestic pharmacy programme is an example of a self-sufficient community project which can be duplicated in other countries. A 52-page booklet on the principles of setting up a medicinal plant pharmacy with prescriptions and information of medicinal plants of the area is available from CAPA (in Portuguese).

The album is a reliable source of information and is used as a reminder of the appearance and correct use of each species.

Yeasts, mould and bacteria

In the third of this series of articles, Dr Peter Fellows looks at a group of bacteria that have an important and widespread impact on food processing – the lactic acid bacteria.

The processing of foods using bacteria and other micro-organisms is commonly known as 'fermentation' and the products that are produced are collectively called 'fermented foods'. There are many examples of traditional fermented foods from all over the world. This article focuses on one group of these fermented foods that use a particular group of bacteria – the lactic acid bacteria – to produce a wide range of processed foods.

Lactic acid bacteria are so called because during their growth on some types of foods, they produce lactic acid. This is important for two reasons: first the acid helps to preserve the food by preventing other types of bacteria from growing and causing spoilage; secondly the acid gives a sharp taste to the food, which together with other flavours produced during the fermentation, results in products that are unique and cannot be made in any other way.

There are many dozens of different lactic acid bacteria, but they are broadly grouped into two types – those in the *Streptococcus* family and those in the *Lactobacillus* family. Traditional fermentations involve a sequence of different bacteria that each grow on the food and are then taken over by another type as the acid content in the food increases. *Streptococcus* species are not so tolerant of acid and usually grow first. They produce lactic acid and when the level reaches about one per cent, they become inhibited and *Lactobacillus* species take over. They continue to produce lactic acid until the level reaches about two or three per cent, which is high enough to stop spoilage and to give the characteristic sharp flavour. Other lactic acid bacteria that are commonly found include *Pediococcus* species and *Leuconostoc* species. Examples of the wide variety of fermented foods that are produced by these bacteria will be included in a future IT publication – *Traditional Food Technologies*. The conditions used in processing are shown in the table below.

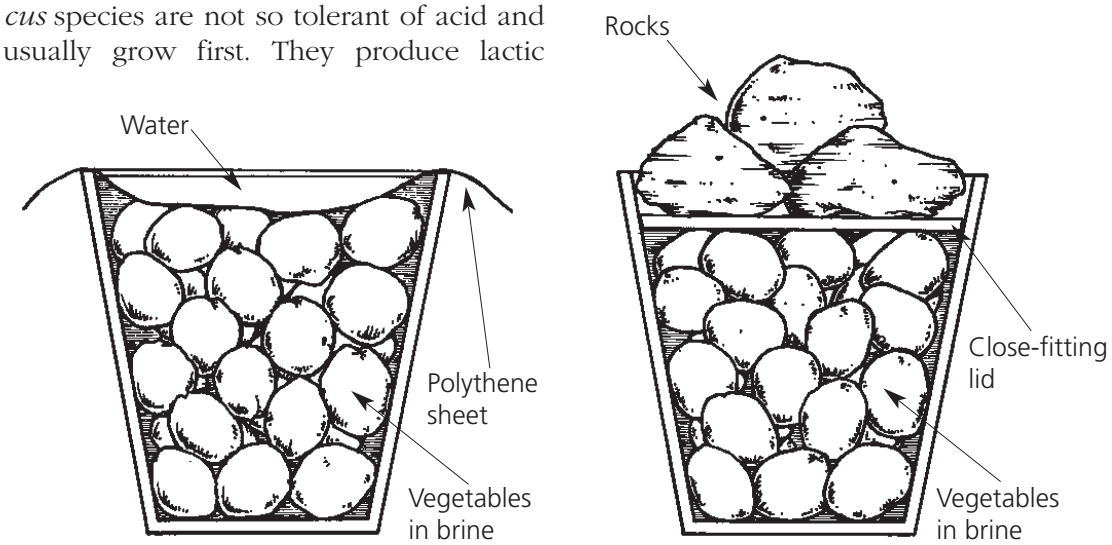
To make fermented foods using lactic acid bacteria is relatively straightforward, but it should be emphasized most strongly that special attention should be given to hygiene. If contaminated water, spoiled raw materials, or workers with poor personal hygiene are involved, there is a very real risk of causing food poisoning. Some examples of how to make these fermented foods are given below.

To make fermented foods using lactic acid bacteria is relatively straightforward, but it must be emphasized most strongly that special attention should be given to hygiene.

FERMENTED VEGETABLE PRODUCTS

Olives, cucumbers, aubergines and many other types of vegetables can be fermented to make pickles. The vegetables are washed carefully in clean water, and all leaves, stalks etc are removed. Only fresh vegetables, without any mould or rot should be used. The vegetables can be sliced or chopped or used whole.

They are placed in a clean pot or drum,



Methods for keeping air out of fermenting pickles

Table 1: Conditions used in processing

	Incubation conditions		
Food	*Temperature (°C)*	*Time (Hours)*	*Other conditions*
Cassava	Ambient	96	
Fish	Ambient	3-12 months	Dry salting using a fish to salt ratio of 3:1 or 5:1
Maize	Ambient	24-72	
Meat	15-26	24	Ensure a moist atmosphere during fermentation (relative humidity of 85-90%)
Vegetables	Ambient	48-260	2.5-6% salt
Yoghurt	30-45	3-8	

preferably made from food-grade white plastic, enamelled steel or stainless steel. It is not a good idea to use aluminium, copper or wooden vessels. They are covered with a weak salt solution (see table) to prevent them spoiling before the lactic acid bacteria can start growing. It is important that air is excluded by using either a sheet of plastic weighed down with water or a lid weighed down with stones (see illustration opposite). If air is allowed in the vegetables will go mouldy at the surface and may even rot.

An alternative method that is often used for sliced cabbage is to place a layer of salt and a layer of cabbage in the drum and keep adding alternate layers until the drum is full. The lid is then weighted down as before, and the juices from the vegetable mix with the salt to form a brine.

The vegetables are left in the container for between two days and two weeks depending on the temperature (higher temperatures give a shorter fermentation time) but the temperature should not be allowed to rise above about 35° C or fall below about 20° C. Fermentation takes from two days up to two weeks, after which the process ceases. The vegetables can then be used as required provided that the lid is securely replaced, or they can be taken out and packed into small plastic bags for sale. The vegetables have a shelf life of many months while they are in the drum and 5-10 days in the plastic bags.

MAIZE AND CASSAVA PRODUCTS

Maize kernels are soaked in clean water for one to three days and then milled to a dough. This is then covered with a clean cloth and left to ferment for one to two days. It is then cooked into a thick porridge or formed into balls and steamed for 1-2 hours and eaten. Foods of this type are widely eaten, especially in West Africa where a popular example is Kenkey in Ghana. Similarly, cassava is grated, and the pressed pulp is fermented. The fermentation increases the acidity and removes the poisonous hydrogen cyanide. The fermented food is dried to a granular flour which has a shelf life of several months. It can then be made into a wide range of doughs and porridges. These fermentations are used mostly to give a characteristic flavour to the final products.

DAIRY PRODUCTS

There are a very large number of cultured milk products throughout the world, including kefir, koumiss, yoghurt, cheese, buttermilk, soured cream, and leben – so many in fact that it is not possible to describe them in detail in an article of this size. The basic idea however is to allow the growth of lactic acid bacteria in the milk or cream to change the flavour and the texture of the product and to preserve it.

Typically, milk is heated to just below its boiling point for 15 to 30 minutes to destroy contaminating bacteria. It is then allowed to cool to body temperature and is either inoculated with a commercial 'starter culture', which is often sold in pharmacies in larger towns, or with a small amount of a previously prepared product.

The milk is allowed to ferment in a warm place (see table) and the acid that is produced causes the proteins in the milk to form 'flocs' or curd. The size of the flocs and hence the texture of the product

If contaminated water, spoiled raw materials, or workers with poor personal hygiene are involved, there is a very real risk of causing food poisoning.

depends on the conditions that are used. These conditions also control the production of flavours, and small changes can result in the wide variety of fermented milk products that are found. It is up to the local producer to decide what texture and flavour is most acceptable and then carefully follow the exact process each time. Later processing may also include pressing the curd to form balls or layers, or drying the curd to extend the shelf life.

Later processing may also include pressing the curd to form balls or layers, or drying the curd to extend the shelf life.

MEAT AND FISH PRODUCTS

Again there is a very wide range of these products, especially fermented fish products such as sauces and pastes, in South East Asia. Strict control of hygiene is essential for all products in this group.

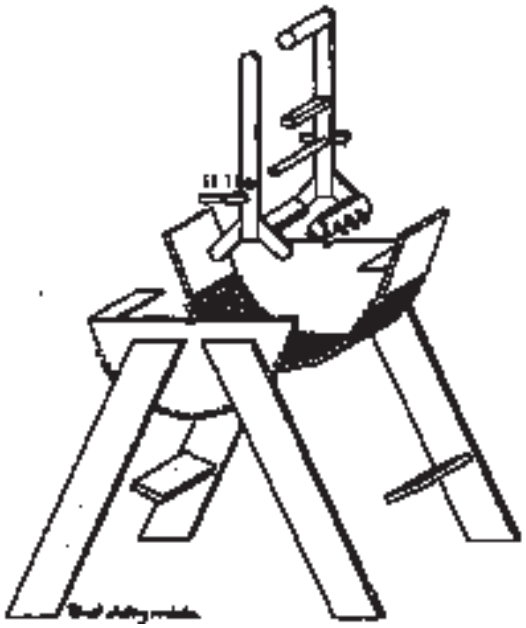
For meats, the basic process involves preparing the meat so that it is free of skin, bone and any sign of disease or spoilage. It is then chopped into very small pieces and mixed with spices, curing salts (sodium nitrite and sodium nitrate), starter culture, salt and sugar. The exact proportions of each ingredient and the types of spices used, are found by doing trial batches to see which are the most acceptable recipes for local consumers.

The mixture is then filled into sausage casings using a 'sausage stuffer' and allowed to ferment (see table). The sausages are then pasteurized in hot water at 65-68° C for four to eight hours and dried by hanging them in warm air for 12 to 16 hours. They may also be smoked instead of drying.

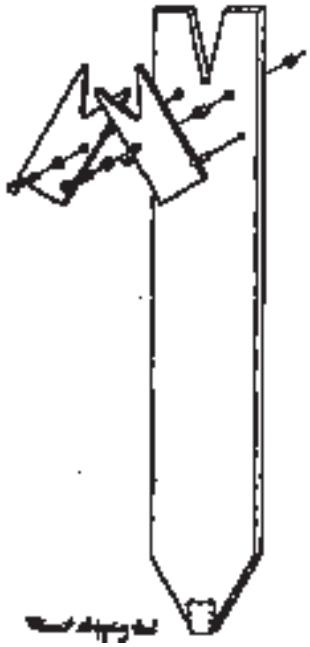
The preservation of meat in this way is achieved by a complex set of processes including the action of the curing salts (which also keep a red colour in the meat), the lactic acid produced during the fermentation, the heat during pasteurization and smoking, and the low moisture levels after drying. As a result, small variations in any one of the ingredients or processing conditions can produce a different product. The producer needs to find a process that makes an acceptable product, and then carefully ensure that it is followed exactly each time.

Small-scale equipment

This article is intended to disseminate information on the building of two simple wooden tools to reduce the amount of labour needed during the post harvesting of ground nuts in developing countries. These tools are easily constructed by workers and their families with a minimum of hand tools using locally available, inexpensive materials. They can be used safely and efficiently without disrupting traditional family or community post harvesting activities. These tools are based on the ideas and needs of campesinos living in Loja, southern Ecuador, where the main cash crop is peanuts. They were developed by industrial designer David Ryan in collaboration with agricultural engineer Segundo Marin Gomez.



Peanut stripping tool and peanut shelling machine.



These tools are easily constructed by workers and their families with a minimum of hand tools using locally available, inexpensive materials.

STRIPPING TOOL

The first tool is the stripping tool. It's job is to help strip the pods from the ground nut plant. It is portable so that it can be carried to the ground nut fields, which are invariably some distance from the communities and situated on steep hillsides. Once at the field the worker can fix the tool upright by embedding it in the soil. A bunch of ground nut plants are then offered, roots first, into the open jaws of the tool. The plants are pulled downwards and towards the body simultaneously, striking the jaws and causing them to rotate and close around the plant as it is pulled through the plant, in turn trapping the pods and stripping them from the plant as it is pulled through the tool. When the plant is fully removed, the counterbalanced jaws return to their open position ready for the next stripping action. The ground nuts are spread out on sheets in the field to dry, ready for shelling.

The stripper is constructed from one plank of wood, some hardwood for the moving jaws, two nut and bolt sets and a piece of a tin can to cover the pointed base.

SHELLING MACHINE

The second tool is a shelling machine. The design is refined from a well proven principle of shelling. This consists of crushing the ground nut pods between rotating wooden arms and wooden slats. However, in this present design, the movement of the crushing arms is changed from a rotating mode to a reciprocal one. This allows for a simplified design, reducing its size, reducing the amount of materials in the construction and preventing the build up of pod fibre around the axis, an annoying problem with the rotating type.

Car tyre rubber is used to cover the crushing arms in order to reduce damage to the nuts. The rubber is also cut so that little fingers of rubber continuously rake the mix of crushed shells and nuts, helping the nuts to fall freely and quickly

David Ryan and Segundo Marin Gomez

The stripping tool in use

between the wooden slats, carefully spaced to accept the size of the nut typical of the region. A simple process of winnowing is used later to separate the broken shells from the nuts.

The ratio between crushing efficiently and damage to the nuts is dependant on the gap between the crushing arms and the wooden slats. A gap of 25mm has proven to give the best results, with four per cent or less damage.

The sheller is constructed from two planks of wood, a piece of steel tube, used car tyre rubber, nails and wood glue (see drawings above).

The cost of manufacture of both tools is essentially the cost of the materials, as the construction is carried out by the workers and their families themselves. With proper care and maintenance, the tools should last indefinitely.

In Ecuador, field trials for the campesinos and their families proved the tools a success, with most families wanting their own, and willing and capable of constructing them themselves.

David Ryan was working as a CIIR volunteer (Catholic Institute of International Relations, London), with CATER – University of Ecuador, Loja. He is presently an Industrial Designer and consultant, as well as Professor of Design at the University of Illinois.

Segundo Marin Gomez is an Agricultural Engineer with CATER – University of Ecuador, Loja.

For further information contact David Ryan at Industrial Design, 110 South Race, #201 Urbana, IL 61801, USA

Indigenous fermented cereal snacks in Kenya

Cereals form the staple food for most communities in rural and urban Kenya.

Maize, millets and sorghums are the main cereals consumed either as whole roasted or boiled grain. Maize is mixed with legumes to give a balanced diet among many communities too. But the conventional way of processing is to mill the grain into a meal that is used to make a thick or thin porridge, *ugali.*

Vegetables also play a very important role in supplying vitamins and minerals and are served together with *ugali* to make a complete meal.

One thriving traditional household technology is the processing of the cereal meal into fermented flour used to make *tsimbale* (dry roasted flour) and *vitumbu* (deep fried fermented dropscones fortified with groundnuts and vegetable flour). Both of these products meet the food security demands of the school age children and youths from 3 years to 18 years. The snacks are also consumed by adults, especially *tsimbale,* during farm preparation providing energy prior to food preparation after a hard day's work.

The best products result from using dry whole cereal grain at less than 13 per cent moisture content. The flour meal that has passed through a coarse 500µm sieve is most preferred. This flour is rough with few fine particles because the fine flour is easily blown away by the wind during roasting which is done outside the house.

The fermentation process imparts the desired flavour to the flour while also increasing its shelf life due to the increased lactic acid content.

The whole milled flour is mixed with water in the ratio of one part flour to one part warm water and the slurry left to spontaneously fermentation for 12 to 48 hours, after which any floating scum is removed. The sediment is fried on a moderate open fire outside the house with constant turning to avoid stickiness and darkening of the final product that should be uniformly brown and dry when ready. In case of incomplete drying the product is exposed to the sun for further drying.

After cooling it is packaged in sealed pots or plastic bags. The fermentation process imparts the desired flavour to the flour while also increasing its shelf life due to the increased lactic acid content. The simple sugars produced in the process are easily absorbed into the body providing the nutrient requirement of the fast developing child and youth. Due to the product's availability and portability the nutrient requirements of school children, labourers, herding boys and the family are met promptly. The product can be eaten as dry flour, or with water, juice, milk and sugar to improve palatability.

INDIGENOUS KNOWLEDGE

Weaning children should consume the flour sparingly as it tends to cause constipation and interfere with immunity system and resistance to disease during child development. This indigenous knowledge is deep set in the community who are aware of the quantities each child is allowed. With increased post harvest losses, women treasure this traditional product as a way of ensuring food security. This product is not prone to attack by weevils, requires no fumigation and is readily available.

Conversely *vitumbu* requires fine flour, passing through a fine 250µm sieve in order for it to bind together and form balls. *Vitumbu* production is simple and entails forming the fermented drained wet flour into balls and deep frying. Both *vitumbu* and *tsimbale* are sold in Kenya's market places in western province as handy snacks to hungry business men and women and long distance travellers.

To enrich *vitumbu,* eggs and precooked vegetables may be beaten into the dough prior to deep frying.

With the high cost of fumigants used in post harvest storage, awareness of this technology is being created among community groups with the sole principle of reducing moisture content, increasing the acid content and adding value to the raw products in order to increase income among the communities. The resources generated from this food are used for purchasing high protein foods and minerals and vitamins.

This article was sent in by Dolline Busolo, the community nutritionist of KENGO – Kenya Energy and Environment Organizations, Mwanzi Road, Westlands, PO Box 48197, Nairobi, Kenya.

Processing for people and profit

This article was written by Kathryn H Potts, the Overseas Business Development Director of Traidcraft Exchange.

Every day the Ratnasiri family in Hambantota, Sri Lanka, ferments buffalo milk to a delicious creamy curd. Once packaged in ceramic pots, the curd is sold in the local market. Last year the Ratnasiris' turnover was US$2700. The manufacture of this dessert has positive benefits for the local community as well – a wide range of local skills is supported and developed, from food technology and ceramics to marketing and distribution. 100 per cent of the economic wealth created remains in Hambantota.

In the same community, the local retailer buys and sells a Nestlé dessert, earning the trader a retailer's margin and for the Nestlé Corporation in Switzerland, extra profits. The product contributes towards the shopkeeper's income and the overall viability of the store, but supports no other skills in the community.

In 1992 the combined sales of Nestlé and Philip Morris – the world's two largest food companies – totalled US$86,438; equivalent to around US$16 for every man woman and child. Yet we can see that the Ratnasiri enterprise (and numerous other small-scale food producers) meet the needs of large numbers of the world's consumers in a way which supports the local economic, social and technical fabric of our societies. They are a vital part of our inheritance and future at local, national and international levels where production and trading is about relationships between people. As consumers in the North or South doing our everyday shopping, we make daily choices affecting the lives of producers and processors world-wide. We can use this purchasing power, firstly by understanding the sources of the goods we buy, and secondly by making informed choices to support fairer trading. This concept of fairness recognizes and acknowledges, through a purchase, the value of ALL the inputs into the product.

SMALL-SCALE FOOD PROCESSING

The Ratnasiris' buffalo curd business provides employment to family members and five local people. The ceramic pots are locally produced by a business with seven employees and the distribution business is based in the next town. This vertical integration of the business chain within the local community at the source of the skills used, (production, packing, distribution,

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This vertical integration of the business chain within the local community results in the generated income remaining in the community.

Antonio Chunn and Justino Peck, members of the Toledo Cacao Growers' Association, which secured a favourable three-year cacao deal.

and retail), results in the generated income remaining in the community. Working in small-scale food processing is also one of the easiest ways for women to gain confidence and some control in their lives. In Kenya a maize doughnut called Mandazi can be made at home, and sold in local markets to bring a daily income.

Indigenous technical knowledge – and women's in particular – is often given low status by policy-makers and development practitioners. This situation must be reversed: there are numerous excellent examples of such knowledge proving to be scientifically based. For instance, in Sudan, women carry out unique 40-step fermentation processes with the utmost care which means the foods can be preserved in the hot climate for up to two years. Each step can be accounted for in laboratory tests: women understand how enzymes work and use them with scientific accuracy.

Women who live hundreds of miles apart, with no apparent channels of communication continue to perform identical technical steps with equal precision. This knowledge is unprotected by the GATT proposals on copyrights, unlike the recipes and processes of multinational companies described by GATT as 'valuable research based knowledge'. With the current demise of small-scale food production such invaluable experience is either being lost or exploited by others.

LARGE-SCALE FOOD PROCESSING

The success of the large multinationals' production and distribution systems and advertising campaigns is obvious. We can sit down for breakfast almost anywhere in the world and munch Kelloggs Cornflakes and drink Nescafé. Mass production facilities were developed in the 50s and 60s to serve the wealthy markets of the North. As these markets became saturated, others were developed world-wide; companies targeted rich and poor alike. Promotional messages lead consumers to aspire to products associated with Northern values and levels of wealth. In the case of the consuming poor, this was at the expense of basic necessities. Locally produced food such as tablea in the Philippines (large chocolate tablets which are mixed with sugar and water to make a traditional drink) is often denigrated, at the same time consumption of 'luxury image' goods processed in the North such as drinking chocolate, is promoted.

The foods produced by multinational companies reflect the values and needs of the 'home' country, leaving these cultural imprints in the South long after they are consumed. These goods encourage consumers in developing countries to emulate consumption patterns of industrialized countries. At national levels, policy-makers – often from wealthy backgrounds – allocate resources reflecting these same patterns with dramatic development consequences.

GLOBAL TRENDS

There is a strong global trend towards large-scale processing, which is institu-

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Justino Peck stripping beans

Table 1: Tariffs on tropical products by degree of processing in major world markets

Commodity	*EC*	*Japan*	*USA*
Coffee			
Raw beans	9	0	0
Roast and ground	16.5	20	0
Instant	18	20.5	0
Cocoa			
Beans	3	0	0
Paste	15	15	0
Butter	12	2.5	0
Powder	16	21.5	0.4
Chocolate	–	26.7	1.9
Spices			
Unground/unprocessed	7.5	1.2	0.7
Ground/Processed	11.8	6.6	4.5

Source: Belinda Coote, *The Trade Trap*, Oxfam Publications 1992

tionalized in tariffs, legislation and the control of technology, expertise and power. Is this a problem? Fish and meat are the main food-product groups exported by developing countries which have been affected by the harmonization of technical standards by the European Community (EC). All slaughterhouses and processing factories have to be licensed by EC inspectors before their products can enter the Community, and fish and fish products will have to meet certain standards through the compulsory licensing of fishing vessels and processing plants. The level of investment needed to upgrade facilities to meet these new standards will mean, inevitably, that poorer countries suffer. There is also concern that these measures could be used as a veiled form of protectionism. Where the legitimacy of standards ends and protectionism sets in, is hard to define. The American soya bean lobby attempted to raise a non-tariff barrier against coconut oil in 1984, by claiming it to be a health hazard, containing aflatoxins, because the oil was perceived to be a threat to its own share of the US vegetable oils market. Eventually the proposed legislation was not passed, but only after equally heavy – and expensive – lobbying by the United Coconut Association of the Philippines.

Northern control of technology, supported by tariffs favouring the importation of raw materials (see table 1) rather than processed foods, discourages Southern exporters from developing their own processing industries. These tariffs protect a small number of companies who dominate each sector of Northern markets. If coffee producers could themselves sell roasted coffee or instant coffee they would increase the value of the exports. Such vertical integration is not the whole answer, however, pressure by vested interests can also intervene. Brazil scrapped a plan to market its own instant

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ATOs dealing directly with small-scale producers or institutions, pay a fair price for the goods that reflect the cost of production and skills needed.

coffee in the USA after being threatened by a cut in US aid.

Even if the processing of raw materials is carried out in the country of origin, it is almost certainly concentrated in the capital city. In Malawi, groundnuts are transported to Blantyre, to be processed into edible oil; this leaves no supplies for local processing, resulting in an erratic supply of oil in nut growing areas! This scale of production can result in a continual drain of human resources and raw materials from the countryside. The Southern entrepreneurs who previously owned and controlled the processing technologies and marketing operations are now, at best, traders at the end of the marketing chain.

There are also positive benefits, such as where new varieties of food have been made widely available. Noodles are a staple food requiring a minimum of cooking, so saving time and fuel, and therefore particularly suited to the needs of some developing countries. If a few companies monopolize a market it is rarely to the benefit of the consumer or raw material producer.

SOUTHERN RESPONSES

Working together for solidarity and efficiency, sharing information and identifying a market are the key actions. Twenty one women in Addis Ababa are processing spices and herbs which they buy directly from farmers whenever possible. Some of the processed spices are exported as a mulled wine mix to Traidcraft, an alternative trading organization in the UK, and generate a 15 per cent net profit.

Before international organizations such as GATT will recognize local appropriate technologies, Southern development agencies must themselves do so.

Cocoa, grown by about 700 farmers in co-operatives in north eastern Bolivia, is processed by their federation El Ceibo. El Ceibo is probably the first producer co-operative in the world to manufacture its own finished chocolate products, but the chocolate does not meet EC requirements. El Ceibo provides transports and technical advice and now runs a network of farm shops supplying basic foodstuffs. It was formed in the late 70s to break marketing and transport monopolies of private middlemen. Since then it has become the chief price regulator in the region; its members returning home with basic commodities after delivery of cocoa to La Paz. El Ceibo processes cacao powder and butter for export to Europe and markets chocolate and sweets locally.

RESPONSES IN THE NORTH

Alternative trading organizations (ATOs) across Europe are demonstrating that buying and selling fairly traded goods can make a difference. By dealing directly with small-scale producers, or institutions that serve or represent them, they pay a fair price for the goods that reflect the cost of production and skills needed. They also provide credit when it is needed by sending a pre-payment with the order so that producers – like the group in Addis Ababa – can buy the spices to process in the first place.

Four British ATOs are working together to place large prepaid orders for coffee with producers in Mexico, Peru and Costa Rica. The producers control the export process themselves, and at the same time, learn directly about the demands of international trade. Higher prices (some 2.5 times the market price, to date) are paid directly to producers for reinvestment in their communities. The roast and ground coffee is sold in supermarkets throughout the UK under the brand name Cafédirect.

Careful market research prior to launching the product, identified customers who wanted good quality coffee in their local supermarkets which had the added value of 'fairer trade'.

The agreement under the General Agreement on Trade and Tariffs (GATT) to protect the rights of copyright holders is of widespread concern, given the emphasis it places on research based knowledge, while 'traditional' knowledge is not similarly protected. Lobbying to ensure this is addressed is a responsibility of organizations in the North and South. Before international organizations such as GATT will recognize local appropriate technologies, Southern development agencies must themselves do so. The barriers to fair trade are great, and increasing, but all of us can take action to challenge them by using our purchasing power to support locally produced and fairly traded goods.

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