

CANNING OF FOODS

Although it is possible to obtain small-scale canning equipment there are a number of reasons why this type of food preservation is not recommended for small-scale producers. These reasons are described in detail in this technical brief.

Canning (or heat sterilisation) uses heat to destroy the enzymes and micro-organisms that would otherwise spoil foods. As different enzymes and micro-organisms are likely to be present in different foods the amount of heating (both the temperature and time) needed to safely process the food will vary according to the type of food being canned. In addition, the temperature and time will vary according to the size and shape of the can being used.

If the food is not heated sufficiently there is a risk that micro-organisms will survive and grow inside the can. In some foods (especially vegetables, meat, fish, milk and other 'low acid' foods) a particular type of bacteria called *Clostridium botulinum* can grow and cause severe food poisoning.

If the food is over-heated the quality is reduced and it can become colourless, tasteless or burned and have a soft mushy texture which customers will find unpleasant. It is therefore essential that the correct heating conditions are carefully established and maintained for every batch of food that is canned. This requires the skills of a qualified food technologist/microbiologist.

When foods are heated in a sealed can, there must be an equal pressure outside the can as inside (otherwise the can will explode). This is achieved by heating the cans in a strong metal vessel named a retort, using high-pressure steam.

When the hot cans are cooled using water, the pressure in the retort is kept the same as that inside the can using compressed air. The retort must therefore withstand pressures of up to 60psi and be fitted with a safety valve and other pipework for water, steam and compressed air.

In addition to a retort (cost approximately £2000 for a small model) the process also requires a steam generator (approximately £1000) and an air compressor (approximately £500). Each of these pieces of equipment also requires a controller and will need regular maintenance by a skilled technician.

Assuming that cans are available, they are usually considerably more expensive than other types of packaging materials. The inside of the cans should be lacquered to prevent foods reacting with the metal during storage.

Different types of lacquer are needed for different foods (fruit products, vegetables, meat and fish each require a different type). In addition a 'seamer' is needed to correctly fit the can lid (a hand operated seamer costs approximately £300) and regular checks are needed to make sure that the seams are properly formed. This needs training and experience, together with a seam micrometer (cost approximately £80).

Finally, because of the potential dangers from food poisoning with some types of food, it is necessary for a trained microbiologist to routinely examine samples of canned food that have been subjected to accelerated storage conditions. This requires a supply of microbiological media and equipment.

In summary the canning process requires a considerable capital investment, the need for trained and experienced staff, regular maintenance of the sophisticated equipment, a supply of the correct type of can and comparatively high operating expenditure. There is also a

Knowledge and Information Services, The Schumacher Centre for Technology & Development
Bourton Hall, Bourton-on-Dunsmore, Rugby, Warwickshire CV23 9QZ, UK

Tel +44 (0)1826 634400 Fax +44 (0)1826 634401 E-mail info@itdg.org.uk Web <http://www.itdg.org>

Intermediate Technology Development Group Ltd Patent HRH - The Prince of Wales, KG, KT, GCB
Company Reg. No 071984, England Reg. Charity No 247267 VAT No 241 2164 52

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requirement for equipment to prepare the food and fill it into the cans which is not included in this brief. For these reasons ITDG does not recommend this process for small-scale production.

References and Further Reading

Packaging food in Glass, Technical Brief, ITDG

Packaging Materials, Technical Brief, ITDG

Small-scale food Processing: A guide to appropriate equipment, Edited by Peter Fellows & Ann Hampton, ITDG Publishing/ CTA 1992

Appropriate Food Packaging by Peter Fellows & Barry Axtell, ILO/TOOL 1993

Packaging, Food Cycle Technology Source Book, ITDG Publishing/ UNIFEM 1996

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