

get on the market under the guise of dairy-bred calves and, when purchased by some other dairy farmer, ruin his output of milk.

In dealing with a low producing herd of nondescript cows, there are some people who would probably say, "Fatten off and slaughter the lot", while, no doubt, a certain amount of weeding out and slaughter of old and diseased cows may with advantage be carried out. In the writer's opinion the present is not the time for the slaughter of even poor dairy stock on a large scale, for there is a shortage of cattle in Europe, and this country needs all the milk that can be produced. Rather, I believe, should we begin immediately to grade up these poor cows by the use of good bulls.

**A good herd in two generations** The rapidity with which 'grading up' to the high producing pure breed can be effected is probably not fully appreciated by those who have not seen it in practice. A low producing nondescript herd can in two generations be made into a herd of quite reasonably good production and type by 'grading up' with high producing, pure bred bulls. The movement for the better breeding of dairy cattle would be given a great impetus if all dairy cattle breed societies would institute a 'grading-up' herdbook, either with or without entry into their present herd book.

The small herd—one too small to justify keeping a well bred bull—is a problem in many areas. The purchase of bull calves should in most cases solve this problem, although an alternative, and perhaps more convenient and less costly means—by artificial insemination from a well bred dairy bull—is now under trial in the Reading and Cambridge districts.

In conclusion, it is evident that there is a need for the problem of breeding for milk production to be attacked on a broad community basis for the common good of dairy farmers—to prevent bad dairy cattle ever being born rather than merely to accept them as inevitable and push the bad ones off on somebody else, thus lowering the efficiency of the industry as a whole. *J. Min. Agri. Sept. 1943.*

## Fruit Bottling

By Miss K. I. NOBLE,

*Demonstrator, Ministry of Food, England.*

**Introduction** Fruit bottling not so long ago, was regarded as a typical country occupation, but the war has made the town housewife equally "preserve minded" and, judging from the queries and general interest in this subject, even keener than her country sister who wisely bottles and preserves every year as a matter of course. To be successful, it is necessary to make sure that everything is done to avoid mistakes, and so whatever method is chosen should be followed carefully and the following points noted.

**Objects** The object of preserving fruit is to destroy bacteria, moulds, yeasts, and enzymes which would otherwise cause deterioration.

**Methods** The methods of doing this are by (1) sterilizer, (2) oven, (3) pulping, and (4) Campden method.

**Water or Syrup** Fruit can be bottled very successfully in plain water, although if sugar can be spared flavour is improved by using syrup, viz. ; 2–8 oz. sugar to each pint of water. Preparation of syrup: dissolve sugar in water and boil for a few minutes, strain. Note—syrup with honey; add two parts of water to one part of honey.

**Preparation of fruit and jars** Fruit should be fresh, dry, sound and firm. It should also be ripe, and whenever possible graded according to size and ripeness. The only exception is gooseberries, which should be bottled when green and hard. Cherries; the dark and red types are best for preserving, e. g., 'Morella'

and 'May Duke'. Apples and pears, when peeled, should be put straight into salt water (1½ oz. salt to 1 gallon water) to prevent discoloration, but not left long before being sterilized.\* They could alternatively be (a) steamed for five minutes, or (b) blanched for three minutes. Currants, black, red or white: stalks should be removed, also blossom ends if very large, and then rinsed in cold water. Soft fruit are hulled and shaken well down in the bottles. Raspberries in syrup are fruit which are inclined to rise; to overcome this fill bottle 1/3rd full of fruit, then cover with liquid and continue alternatively until bottle is full. Stone fruit, e. g., cherries and plums: pack tightly without crushing, using the handle of a wooden spoon, to the top of the jar. Jars or bottles must be washed and rinsed, also examined carefully for flaws or other damage, particularly round lip. Wash and thoroughly dry lids and rubber bands; the latter should be carefully examined and discarded if they show signs of perishing; they should fit easily and, if in good condition, go back to their original size when gently stretched.

**Sterilizing under water** Soak rubber rings in warm water before use. If no special sterilizer is available, use a large deep saucepan, fish kettle, boiler or pail. The receptacle should be deep enough for water to cover the jars when they are placed on a wire or wooden rack, or on several thicknesses of cloth or paper (to guard them from direct heat). If it is not possible to cover the jars completely, the water should reach well up to the shoulders. Cover the receptacle to prevent evaporation. Any of the following jars are suitable for this method: (1) bottling jar with glass top, rubber ring and metal screw band (2) bottling jar with metal top, rubber ring and clip; (3) standard 1 lb. or 2 lb. jam jar with rubber ring, lid closure and clip. **METHOD:** (1) Prepare fruit as described and pack into jar. (2) Fill to top with fresh cold water or syrup if used. (3) Screw top jar—Place rubber ring and glass top in position and screw down metal closure. Now unscrew by one half turn so that it is loosely closed but will allow steam to escape. Clip top jar—Place rubber ring and metal top in position on jar and secure with clip. Standard jam jar, with metal closure—Fit with rubber ring on to sloping edge of lid. Place this on jar and slide the clip on so that it holds firmly in position. The clips, being pliable, should be bent at a more acute angle if necessary to grip well. (4) Place the jars in sterilizer or receptacle, fill with cold water and cover with lid. (5) Heat slowly until temperature reaches 165°F., taking 1½ hours to do so (if no thermometer is available, heat to a slow simmering temperature), and maintain this heat for 10–20 minutes—degree of heat and time maintained depends on the type of fruit. The following Ministry of Agriculture table is a good guide (Leaflet No. 11, Dig for Victory).

	Temperature to be reached in 1½ hours (in degrees F.)	Maintain for (Minutes)
Apples (solid pack) ... ..	175	10
Apples (in syrup), Apricots, Blackberries, Damsons, Gooseberries, Greengages, Loganberries, Mulberries, Peaches, Plums (ripe whole), Raspberries, Rhubarb, Strawberries ... ..	165	10
Plums (halved or unripe) ... ..	165	20
Currants ... ..	180	15
Pears ... ..	190	20
Cherries ... ..	190	10
Quinces ... ..	190	20
Tomatoes ... ..	190	30

(6) After sterilization remove jars, place on wooden board or table and (a) tighten

\* Pears—Only ripe dessert pears should be treated in the manner described here. Cooking pears should be stewed until tender before bottling.

screw band immediately, and again after a few minutes, then leave till the next day; (b) leave clip top bottles as closing action with these is automatic.

**Testing the seal** Remove the screw band or clip and lift the bottles by the lids. If seal is perfect, lids will remain in position. If lid comes off, the seal is imperfect and fruit should be re-sterilized, if necessary in another jar as imperfections are often responsible for imperfect sterilization, or it can be used quickly.

**Oven method** This method is popular because it is quick and simple and, if fruit shrinks to any extent, one jar can easily be filled up from another, replacing in the oven for a further five minutes to complete sterilization. The main points are (1) Prepare fruit and pack as for sterilizer method. (2) Do not add water or liquid. (3) Cover each jar with glass top, patty pan or other lid to prevent top fruit from being overheated. Do not put on the rubber rings in oven, or clips or screw bands. (4) Place on asbestos mats or baking sheet in a slow oven (250°F or Regulo  $\frac{1}{2}$ -1) and heat until the fruit appears cooked and juice begins to run ( $\frac{1}{2}$  to 1 hour—tomatoes  $1\frac{1}{2}$  hours). (5) Fill up jars if necessary and replace in oven for 5-10 minutes. (6) Have ready fast boiling water or syrup. Remove one jar at a time from the oven, place on a wooden board or table, fill to overflowing with boiling liquid and cover immediately. Tighten screw if possible again as the jar cools. Test the seal the next day as in sterilizing method.

**Pulping** Pulping is a useful method when fruit is plentiful; rather over ripe fruit may be used. If storage space is limited, this way can be used and the pulp later made into jam or used for puddings. Fruit is stewed with very little water (tomatoes do not require any, but allow  $\frac{1}{2}$  oz. salt to every 2 lb.). When cooked, and while still boiling hot, pour at once into hot sterilized jars, seal immediately as when bottling and sterilize by placing in a pan of hot water (standing them on a fake bottom) and boil for five minutes. Tomato pulp requires fifteen minutes sterilization. Note—If fruit is sieved (in which case tomatoes and apples, for example, need only be washed and cut up before stewing), the purée must be brought to the boil before pouring into hot jars and sterilized as above.

**Campden method** The Campden method is quite easy but is not recommended for gooseberries or currants as it tends to toughen the skins. Neither is it suitable for sweet fruits such as sweet cherries, dessert apples, pears, tomatoes and black berries. It should never be used for vegetables. The main points are (a) choose sound fruit (b) to each 1 lb. of fruit allow at least  $\frac{1}{2}$  pint of the solution (i.e., 1 Campden tablet crushed and dissolved in  $\frac{1}{2}$  pint tepid water), (c) the fruit must be completely covered with the solution, (d) the jars must be made airtight; metal tops should be protected with wax or greaseproof paper to prevent sulphur coming into contact with the metal. The fruit loses most of its colour but most of it should return on cooking. Before eating the fruit, it and the liquid, should be put in an open pan and stewed gently to drive off sulphur fumes for about 20-30 minutes, or until no taste of sulphur remains; then sweeten to taste and use as required for pies, stewed fruit, etc. Plums, rhubarb and cooking apples are particularly suitable for preserving this way.

**Tomatoes** Tomatoes may be sterilized in a sterilizer, or in the oven. They are very good if preserved in their own juice. Tomatoes should be skinned, halved or quartered and packed tightly into bottles with a sprinkling of salt and sugar between the layers, allowing  $\frac{1}{2}$  oz. salt and  $\frac{1}{2}$  oz. sugar to each 2 lb. Tomatoes. Sterilize as for fruit but bring temperature up to 190°F, in  $1\frac{1}{2}$  hours and maintain for 30 minutes.

**Storage** Bottled fruit should be stored in cool, dry, dark place whenever possible. Metal screw bands should be lightly greased with vaseline on the inside and lightly screwed back on the jars. It is advisable to look over one's store from time to time so that any sign of mould or deterioration is detected in its first stages. *J. Roy. Hort. Soc.; Sept. 1943.*