

INFOSHEET 7

School canteens

School canteens need to provide hot and cold food on demand in a fresh and nutritious condition. This means there is an obligation on the canteen operators to maintain health standards at all times, but there still remains considerable scope to make energy and cost savings.

The table below shows an estimate of the energy consumption and operating costs of a range of equipment commonly found in a school canteen.

The figures show that there are several items, which use significant energy and have potential for savings. High operating costs can be attributed to equipment which:

- has a high power rating (usually heating appliances); and/or
- is switched on for long periods of time (often freezers and refrigerators).

Equipment	Assumed hours of use per week	Approximate Energy costs per week (\$)
<i>Refrigeration:</i>		
large domestic fridge	168	1.90
domestic freezer	168	3.40
commercial two door fridge	168	8.00
commercial ice cream fridge	168	3.70
<i>Cooking/warming equipment:</i>		
microwave oven	5	0.50
pie warmer	25	4.70
deep fryers	10	4.00
grill plates	10	6.00
bain maries (4–5 units)	25	10.00
<i>Lighting:</i>		
general lighting (18 tubes)	35	4.90
display lighting	35	1.80
<i>Ventilation:</i>		
free standing fans	35	0.50
exhaust hoods	35	1.50
forced wall or ceiling fans	35	0.25
air conditioners	35	5.70
<i>Ancillary:</i>		
bug zappers	168	2.50
radio	35	0.10

Figures are approximate. Actual costs will depend on use and local conditions and electricity tariff.

ENERGY EFFICIENT CANTEEN STRATEGIES

Refrigeration

All canteens have significant refrigeration. Make your fridges and freezers work for you by using them effectively.

Drinks fridges with glass doors cost:

- about \$4.50 per door per week; or
- about \$0.03 per litre of package space per week.

More specifically though:

- a 1.8 m deli fridge costs about \$4.00 per week to run;
- a modern caravel ice cream freezer costs about \$4.00 per week;
- older style sliding lid freezers cost at least \$8.00 per week; and
- a two door drinks fridge costs between \$7.00 and \$10.00 per week.

Size refrigeration to stock quantities

Have the right amount of refrigeration required and no more. Empty space in freezers and refrigerators wastes energy. You only need enough space for the amount of product your canteen sells. It's a waste of space and energy to have stock sitting in your refrigerator or freezer for long periods of time. Enough space to fit between one and two weeks stock is all you will probably need. If you have two or more freezers it may be possible to switch one off during winter.

To work out how much refrigerated space your canteen needs, consider the following questions:

- What quantity of product does your canteen sell per week?
- What are the best product lines for your canteen?
- What are your market leaders? (You can determine this by looking at your invoices, and asking product suppliers). Don't waste fridge space by stocking it with products that do not sell. These are simply taking the place of products that do. Stock that does not sell is wasting energy and money.

Position refrigerators and freezers correctly

Keep a gap of at least 100 mm around your fridges and freezers—this helps heat escape from the condenser coils. Keep fridges away from sunny windows, cooking equipment, and hot air from other equipment or heaters.

Add extra insulation

Pieces of polystyrene foam insulation can be placed over glass tops and doors when the canteen is closed. Each square metre covered saves about one kilowatt-hour per day.

Save overnight

If the lights in the fridge or cool room can be switched off, then do so overnight. Commercial fridges with glass doors and lights inside use significantly more energy than solid door domestic types. These should be dispensed with if possible, but if they must be kept then the lights should be turned off or tubes removed.

Turning off your drinks fridge overnight may not necessarily save you money. By turning it off after closing and on again after 8 am, you will actually be re-cooling it using the most expensive electricity rate. This can cost you more than it would if it were on all through the night even though it does save energy.

Utilise off-peak rates

If your school is on an off peak electricity tariff such as D or E1, (or some contestable tariffs) your fridge will run more cheaply overnight. In this case the installation of a timer can switch off soft drink fridges (and other non critical coolers) at closing time and on again at about 3 am. This can save peak electricity consumption between 2 pm until 11 pm. The main cooling period will then be from 3 am until 7 am which is still at off peak rates. It is also important to be careful of any perishable products—you don't want them to spoil because the refrigeration has been turned off.

Maintenance

Maintain and service your equipment regularly according to the manufacturer's instructions. Clean the condenser coils regularly with a vacuum cleaner or brush. This allows heat to be carried away more effectively. This is most important with fan forced condensers. Temperatures of 3–4°C are recommended for fridges, minus 20°C for freezers. Every degree lower than these increases running costs by 2–3%. Defrost freezers before ice gets to 25 mm thickness. Ice build-up makes your equipment use more energy. Seals on fridge doors must be airtight and without splits or tears. If you can slip a piece of paper between the seal and the fridge, your seals are leaking and should be replaced.

Buying new refrigerators and freezers

Domestic freezers and refrigerators are generally more energy efficient than commercial units and often suffice for many school canteens. If you are buying a domestic type refrigerator, use the Energy Rating label to guide you on likely energy costs.

Cooking and food warming equipment

The energy used to operate cooking equipment is only productive while cooking is actually being done. Save energy and money by turning off equipment when it is not being used. When purchasing equipment, look for models that can heat up to operating temperature quickly, to maximise flexibility of operation.

Scheduling

This involves turning on equipment as required to meet demand and turning off again during quieter periods. Scheduling helps minimise idle time.

Scheduling works even better if you have several smaller machines which can be turned on as required. You can use a pie warmer or microwave to keep small amounts of food warm or cook them between busy times.

Additionally, to avoid equipment operating when not required, inform all staff of equipment preheat times by placing labels with instructions on or near equipment.

Typical preheat times are:

pie warmers	20 minutes (on average)
bain-maries	dry 15 minutes wet 30 minutes
ovens	10–15 minutes
hot water urns	15–45 minutes (depending on capacity)
fryers	15–20 minutes

Use natural gas for cooking

Most electric cooking equipment is expensive to run, especially electric fryers, hot plates and bain-maries. Using natural gas can reduce your cooking energy costs by up to two thirds. LPG will be more expensive than natural gas. Check your local tariffs.

Reduce temperatures during quieter periods

Set back hot plates and fryers to a temperature of no greater than 140°C during quieter periods.

Install heat reflective lids over fryers and hot plates

Ensure that these still allow adequate ventilation to prevent excessive heat build up.

Do not purchase oversized equipment

Not only will it generally cost more to buy or rent, it will have higher energy use. Try to use equipment suited to the size of your canteen.

Defrost frozen food before cooking

Defrosting is best carried out by placing frozen foods in a refrigerator overnight. As well as stopping the need to use a microwave oven or cooker for defrosting, this will also lower the cooling energy needed by the refrigerator.

Some frozen foods are designed to be heated directly from the frozen state—do not defrost these. Note that foods such as chips and other fried food cost the most energy to store (frozen), cook (fried or grilled), and display (bain-marie). Fresh fruit on the other hand has none of these energy costs.

Pie warmers

Pie warmers use a lot of energy and are expensive to operate (\$0.30 per hour while heating). They are sometimes not insulated or only have a small air gap for insulation. The glass or metal doors are also poor insulators. Pie warmers with thermostats (sometimes called simmerstats) should be used.

Lighting

Use compact fluorescent lamps instead of incandescent bulbs. These use only one fifth the amount of electricity of a standard incandescent globe, while still providing the same light output. The higher cost of these globes will normally be paid back in a year.

Use triphosphor tubes instead of standard fluorescent lamps. These tubes give an extra 15% light output and also last up to 50% longer. The extra output from triphosphor tubes means you may be able to eliminate some tubes that you previously needed.

Turn off unnecessary lights. This is by far the simplest way of cutting down on lighting costs.

For example, lights near windows may not be needed during the day.

Refer to Infosheet 3 for more detailed information on school lighting.

Ventilation

Make sure there is enough ventilation in the canteen to stop overheating, especially during summer. This reduces the demand on air conditioners and helps refrigeration equipment to run smoothly. If the canteen is too hot first thing in the morning, this indicates that there is a ventilation problem.

Good ventilation may require:

- opening doors and windows (use screens to keep out bugs);
- installing rooftop ventilators;
- installing exhaust fans and ceiling fans (these cost little to run when cleaned regularly);
- using evaporative cooling rather than refrigerative air conditioning; and
- servicing and maintaining air conditioning equipment.

Timers

Timers should be used on all large equipment to ensure they are not left on unnecessarily.

Timers are easy to install and can be used on hot waters urns and cooking equipment.

By installing timers you can make your canteen safer because equipment will never be left on accidentally outside of school hours.

Hot water

Hot water in canteens is generally used for dishwashing and cleaning. Efficient instantaneous hot water heaters will generally meet this demand well. The temperature should be set at 60°C. Storage hot water systems should be switched off during holidays. For more details see Infosheet 4.

Agreements with contractors

Some school canteens are operated by contractors as a commercial business. This could lead to a distinct lack of control over energy use patterns in a school canteen. Should this occur, consider sub-metering of your canteen so that energy costs can be attributed to the contractor. This arrangement could be included in the rental agreement for your canteen area. There are other options for allocating costs such as requiring the contractor to pay an agreed percentage of turnover for the use of the school's energy. On the other hand, the contractor may wish to have a meter installed to gauge the precise amount of energy being consumed by the canteen alone.

ENERGY PRICING

All operating cost quoted in these info sheets are based on a standard school day and are approximate only. The operating costs are based on an assumed peak electricity tariff of \$0.16/kWh, natural gas tariff of \$0.95/MJ and a LPG price of \$0.70/litre. Schools should check with their electricity and gas retailer for tariffs applicable to their particular schools.