

Electronic cooking

Microwave ovens do it faster, cooler, and often better

Most good inventions — like nylon, cellulose tape, and the zipper — are instant successes. Others — like the Wankel engine, the 10-speed bicycle, and the microwave oven — have to wait for their time to come.

A microwave oven installed in a Vancouver home nearly 25 years ago made local headlines for its ability to cook a roast in 30 minutes and hamburgers in 3 "with nothing more than radio waves to supply the heat." It worked fine and was a great conversation piece, but the price tag of \$1,500 probably helped dampen consumer interest.

Over the next 20 years or so the microwave oven was improved in size, efficiency, safety, and price, and soon became a popular appliance in cafeterias and short-order restaurants. There are probably few Canadians who haven't eaten a meat pie or hot Danish that was warmed up before their eyes in a few seconds in a microwave oven. And now this science fiction appliance has suddenly become one of the hottest new products on the home scene.

It's not going to replace the conventional oven, but it's proved itself to be a very practical and useful addition to any kitchen. The latest models look like portable

TV sets, and are just as easy to handle. They plug into any grounded 115-volt outlet, and can be used anywhere in the house — or outside it, for that matter. They give off very little heat, and use about 1-10th as much electricity as a regular oven doing the same job.

But how do they really work?

Microwaves are a form of radio frequency energy originally developed for radar. The energy in these waves is normally dissipated over long distances, but in a microwave oven it is confined within the cooking cavity. Molecules of water in the food placed inside this area absorb the microwave energy and vibrate at an extremely rapid rate producing heat (A damp cloth will be similarly heated in a microwave oven, but a dry one is unaffected.)

Metal reflects these waves, so you can't use metal containers in a microwave oven. Food can be placed on or in glass, ceramic, paper, heavy cardboard, and most dishwasher-safe plastics. Bacon can be fried on a paper towel, for instance, and take-home food can be heated up in its carton.

The important difference between a microwave oven and a conventional oven is that the heat is produced inside the food itself. The

oven, and the air inside it, is only heated by the food, and remains much cooler than a conventional oven.

Because the heat is produced inside the food, it cooks in about a quarter of the time it would normally take — and no time at all is required for preheating the oven. Cooking time, not temperature, is the variable factor in a microwave oven, and this depends on three things: the food's starting temperature, volume, and density.

1) As with a conventional oven, food from a refrigerator takes longer to cook than food at room temperature.

2) There is only so much energy available in a microwave oven, so the more food there is in it, the longer it will take to cook. One baked potato may take 4 minutes, while three potatoes may take 9.

3) The denser the food, the longer it takes for the heat to travel through it. Thus a 1½-pound piece of meat will take longer to cook than a 1½-pound loaf of banana bread.

You can roast, bake, poach, fry, boil and broil in a microwave oven, but there are limitations as well as advantages. Souffles, popovers, and angel food cake cook too fast and don't set properly. Poultry, fish, and white meats cook beautifully. Beef and other red meats turn out

very nicely, but they don't brown quite as well as we are accustomed to, and only very thick pieces can be cooked rare. Steaks are better done on a conventional grill. (Some manufacturers now provide special browning trays that can be used to sear such items as steaks and chops. Made of a ceramic material with a metallic coating that heats up, the browning tray is preheated in the microwave oven before the food is put in.)

Fresh or frozen vegetables can be cooked in their serving dish with little or no added water, and have far more flavor and color than ordinary boiled vegetables. Corn on the cob cooks in its husk in 3 or 4 minutes.

Eggs can be poached or scrambled but not fried or cooked in their shells, which might explode from the internal steam pressure.

Cookies and cakes that don't need browning can be baked in minutes in a microwave oven. Break and rolls can be heated in seconds, but not baked — again because they won't brown properly. Pastry cooks beautifully, but doesn't brown.

Frozen foods can be thawed very quickly in a microwave oven. A pound of frozen ground beef can be ready for hamburgers in 15 minutes, and a frozen turkey that would take 2-3 days to thaw in the refrigerator can be

ready to cook in less than an hour. TV dinners can be cooked in 7 minutes (the shallow aluminum foil tray is permissible in most models because the food need only be warmed from the top.)

Until the microwave oven came along, it took almost as long to heat up meat pies, canned casseroles, and other convenience foods as it would take to prepare them. Now they can be heated in their serving dishes in a couple of minutes.

There are any number of handy tricks that can be done with a microwave oven. Ice cream that is too hard to serve can be softened in seconds. Damp cloths can be quickly heated for hot compresses. Bread and rolls can be warmed and freshened in less than a minute. Fruit can be canned directly in the preserving jars.

And a surprisingly wide range of dishes can

be quickly cooked from scratch in a microwave oven. Here is a small selection: sole — 9 minutes; chicken stew with dumplings — 39 minutes; lasagna — 15 minutes; beef stroganoff — 8 minutes; stuffed pork tenderloin — 48 minutes; spareribs — 30 minutes; cherry cheesecake — 9 minutes.

What about safety?

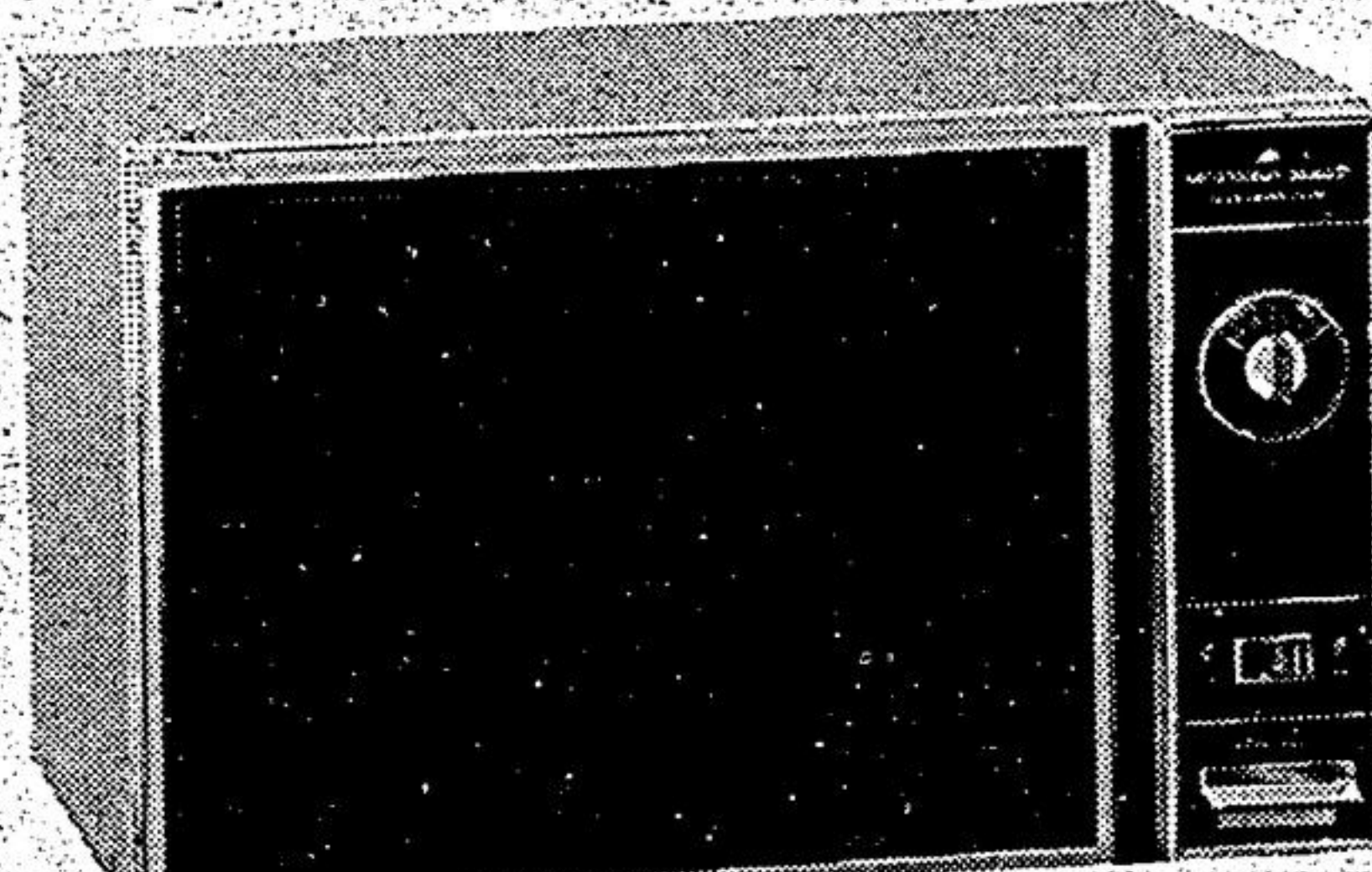
There was a flurry of concern in the U.S. a few years ago about the possible radiation hazard of microwave ovens, but tests conducted by the Radiation Protection Bureau of Health and Welfare Canada have not supported those fears. Microwave radiation, they point out, does not produce radioactivity, and its effect is not cumulative, like x-rays. There is no record in Canada of any ill effects caused by exposure to microwaves.

The microwave ovens sold in Canada are manufactured to U.S.

government regulations, at present the most stringent in the world. The ovens must also pass Canadian Standards Association tests for electrical and radiation safety, as well as emission standards set by the Radiation Protection Bureau of Health and Welfare Canada, which are expected to be made public by the time this article is published. Regulations include as many as three interlocks to prevent the oven being operated when the door is open. (With these, it's quite practical to open the door in order to stir, turn, base, or otherwise attend to the food.)

All things considered, it is our belief that a microwave oven can be a very useful, practical, and efficient kitchen appliance if you have little time for cooking, or your lifestyle calls for a lot of quick snacks for family and guests. It's up to you to decide if these considerable advantages are worth the \$400 to \$650 price range — H.M.

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