



## Cookware: Making a Wise Selection

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Selecting a good set of cookware does not have to be a difficult task. Whether starting a new household or making additions to a thirty-year accumulation of pots and pans, keeping a few facts in mind can make the buying process much easier.

Everyone should know some of the basic facts about cookware and the various materials used in the manufacturing process. Special care considerations for each material are also important. While this discussion centers primarily on utensils used for top-of-the-range cookery, some of the information can also be applied to ovenware.

### The Basics: What to Look For

The following factors should be considered when purchasing a pan that will be used primarily for top-of-the-range (surface) cookery:

- Is it durable, resist denting and a heavy gauge?
- Does the cooking utensil have a flat bottom to fit the heat source?
- Is the pan well-balanced? Does it resist tipping whether full or empty?
- Check the knobs and handles. Are they sturdy and easy to grasp? Will the handle support the weight of the pan, full or empty? Are the handles and knobs securely attached?
- Is the pan easy to clean? There should be no inside seams or crevices that will hold food and/or bacteria. Is the appearance attractive?

### Materials: The Heart of the Pan

Metals have been used for centuries to construct cooking utensils. Their popularity has not diminished because no other material has been found that will do what metals do best—conduct heat quickly and evenly to the food item needing to be cooked.

There are several metals that can be used in manufacturing a pan. They all have advantages and disadvantages. There is no perfect metal for cookware construction. A brief discussion of the more common metals, their advantages and disadvantages, and their care follows below.

#### Aluminum

##### ADVANTAGES:

- excellent conductor of heat
- relatively lightweight
- durable
- comparatively inexpensive

##### DISADVANTAGES:

- dents if very thin
- darkened by alkalis

Generally, a pan of a heavy gauge aluminum indicates better quality. The gauge refers to the thickness of the metal. A heavy gauge aluminum pan will be much thicker than a light gauge pan. The heavy gauge will make the pan more durable and a better heat conductor but will also be more costly.

After several uses the aluminum pan will take on a darker color. This is a reaction to the alkalis in both foods and water and is in no way harmful. This darkening or staining will also occur from putting the pan in an automatic dishwasher. The extremely alkaline composition of dishwasher detergents will speed up the darkening process. If the darkening is unappealing, one might consider hand washing anything made of aluminum.

To remove the staining on aluminum ware, fill the pan with water and add two to three tablespoons of cream of tartar, lemon juice or vinegar. Allow this solution to boil five to ten minutes on top of the range. Then scour with a soap-filled, steel wool cleaning pad. This technique can also be used to clean aluminum measuring cups and spoons. Simply place the stained items in the boiling water-cream of tartar solution.

The staining can also be removed by cooking an acidic food, such as rhubarb or tomatoes, in the pan. Once

again, this reaction of the food with the metal is in no way harmful. The FDA has done extensive testing and considers aluminum a safe material for pots and pans.

### Stainless Steel

#### ADVANTAGES:

- extremely durable
- not affected by foods
- capable of taking on a high polish
- resists scratching

#### DISADVANTAGES:

- expensive
- poor conductor of heat

Stainless steel is an alloy; that is, it is a combination of several metals. The metal that gives the steel its "stainless" qualities is chromium, which must be present in a quantity of 11% or more.

While stainless steel has many qualities which make it a desirable metal for a pan, its poor heat conducting properties would eliminate its use as a cooking utensil were it not for some special manufacturing processes. The most common method of construction is to clad or coat the bottom of the stainless steel with another metal (Figure 1). Aluminum and copper are the most frequently used, since

they do an excellent job of compensating for the stainless steel's poor heat conducting properties. It is best if this bottom metal extends at least a half an inch up the sides of the pan.

A second construction technique is to build the pan in layers, usually referred to as two-, three-, or five-ply. In a two-ply pan the interior is of stainless steel, while the outside is of aluminum or copper (Figure 2). A three-ply pan has an inner and outer layer of stainless, while the inner core is of copper, carbon steel, or aluminum (Figure 3). Five-ply pans have five layers. Usually the inner and outer layers are stainless steel with three inner layers of aluminum (Figure 4). The three- and five-ply pans can also be aluminum or copper clad. The more involved the construction technique, the more expensive the pan.

Stainless steel is the easiest material to keep clean. Usually, just simple hand washing in hot sudsy water or the dishwasher will keep the pan looking like new. Immediate and thorough drying will prevent water spots from forming.

Sometimes a stainless steel pan develops a mottled, rainbow-like discoloration. This is called heat tint and is caused by having the pan over a high heat for a great length of time. This discoloration can be removed by using a commercial stainless steel cleaner.

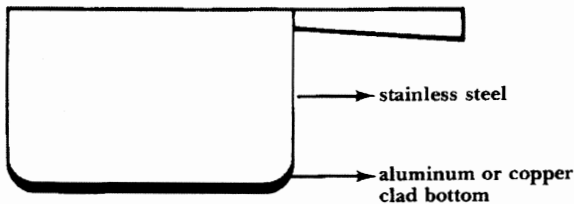


Figure 1. Bottom-clad.

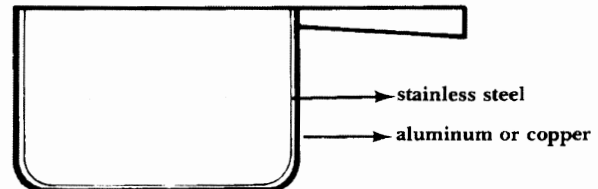


Figure 2. Two-ply.

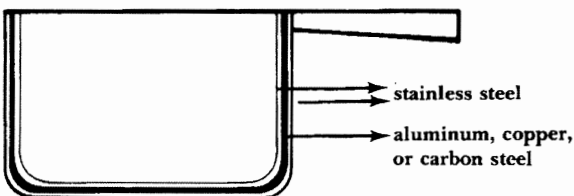


Figure 3. Three-ply.

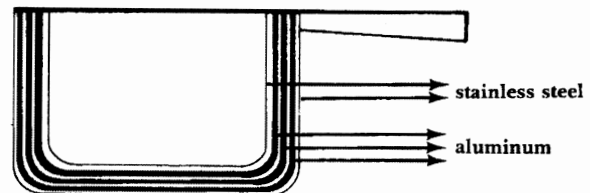


Figure 4. Five-ply.

## Cast Iron

### ADVANTAGES:

- holds heat well
- heavy

### DISADVANTAGES:

- can be brittle
- rusts

Cast iron utensils have been around for centuries. They have recently regained popularity with the "back to nature" movement. In the process, users have discovered that cast iron can help save energy. For items that need a long cooking time (such as stews) once the pan has been heated it will maintain that temperature with the heat source turned down very low.

Today's cast iron is greatly improved over that of even very recent years. It has much more strength and durability. However, care of this metal is different from the others. Since cast iron is preseasoned it should never be scoured or washed in strong detergents. At the most, the pan should be washed in mild, hot, sudsy water. Some users merely wipe out the pan with a paper towel. It is very important that the pan always be thoroughly dried. If in doubt, set it over a low heat on the range to finish drying. Any excess moisture can cause rusting. Also, the pan should not be stored with its lid on, since this may cause the metal to "sweat" and therefore rust.

If the pan needs to be re-seasoned, scour and dry it thoroughly. Rub the inside with unsalted cooking oil or shortening and heat it in a moderate oven for two hours. Wipe out any excess grease when finished.

## A Word About Glass

Glass as a material for surface cookware can be highly unsatisfactory. It can give very satisfactory results with oven bakeware, but with surface cookery much care is needed. Glass is not a good conductor of heat and will form hot spots that can easily cause scorching and burning unless carefully tended. Glass is also slow to heat up and therefore is not energy-efficient. Persons who use glass cookware and are satisfied with the cooking results have most likely used it for several years and have probably made adaptations to compensate for the problems normally encountered.

The best use for glass surface cookware would be the double-boiler. Here one can stir a sauce and keep an eye on the water below. Metal double-boilers make control of the boiling water difficult.

Pyroceram glassware, with its typical milky white opaqueness, has commonly been used on the smooth-top ranges. With the older range models this type of cookware was essential for getting satisfactory cooking results. Today's smooth-top models will accommodate metal or pyroceram cookware.

## Finishes

Finishes, whether metallic or non-metallic, are applied to a pan to improve its quality. A finish usually helps to make up for a trait that is lacking in the basic metal.

### Copper

Copper is primarily used as a finishing material. An example of this, already noted, is the copper-clad stainless steel pan. Copper is an excellent heat conductor and is therefore often used this way to improve the stainless steel. When used as the entire cooking vessel, as in a teapot, the inside is usually lined with tin. Copper by itself discolors foods in a way that is often unappealing to the eye and can give a metallic flavor. Therefore, it is very rare to find a solid copper cooking utensil with no lining of some sort.

Copper can be easily cleaned with a commercial copper cleaner. An alternative to this is a combination of vinegar and salt, which will also bring the copper back to its original shine.

### Tin

Tin is found most commonly on bakeware. Baking pans made of steel are dipped in molten tin as a final finishing process. The tin serves to protect the steel, which is highly susceptible to rusting. Tin has an important characteristic that must be kept in mind. When new, it is very shiny and therefore tends to reflect oven heat. As it ages, it darkens and will absorb more oven heat. Therefore, its heat absorption properties change and should be noted when baking. Tin also scratches easily, and eventually the steel below will be exposed.

### Porcelain Enamel

Porcelain enamel is a glassy substance which is fused to metals at very high temperatures. It has been in use, it is believed, since before Christ. It is an extremely popular finish primarily for the exterior of pots and pans, since it can be combined with coloring agents to give an almost unlimited variety of color and design. Besides being attractive, porcelain enamel has many practical qualities. It is stain and scratch resistant, it is resistant to chemicals, it will not pick up food odors, and it is not subject to fading or peeling.

Porcelain enamel should not be put in direct contact with high temperatures for long periods of time. It can be easily cleaned in soap and water. For burned-on food items, a long soaking and gentle scouring with a non-abrasive cleaner is effective.

### Non-stick Finishes

Non-stick finishes are known by a number of different brand names. The primary reason for their use, of course, is that they allow for easy and quick clean up of pots and pans. Non-stick finishes have been greatly improved since they first came on the market. Early dissatisfaction was attributed to the ease with which these finishes were

scratched. Today care must still be taken, but many manufacturers now claim that ordinary metal utensils can be used on their non-stick finishes. The scratching that may occur in no way affects the non-stick properties of the finish. It is primarily unattractive.

Oils and fats are not necessary when cooking in a pan with a non-stick finish. Some people use them anyway, as they like the flavor given to a food cooked in this manner.

Care of the non-stick finish is relatively simple. Mild detergent and water should clean the pan very easily. Obviously, abrasive cleaners should not be used. In surface cookery, non-stick finishes tend to perform better if used only with low or medium heats.

Some of the non-stick finishes can become discolored. This discoloration can be removed with a commercial non-stick finish cleaner or a mixture of one tablespoon liquid bleach, one tablespoon vinegar, and one cup of water simmered in the pan five to ten minutes.

### **Use and Care in General**

All new pans should be washed before use. This is done to remove any manufacturing oils left on the pans.

A metal pan should never be immersed in the wash water while it is still hot. One should also wait for the pan to cool before filling it with water to soak. When the pan is exposed to sudden temperature changes, the metal can warp. If this is done frequently enough, the pan will lose its shape and no longer be an efficient cooking vessel.

Always read and file for future reference the manufacturer's instructions that come with the pan.

Should a handle or knob come off or be lost, it can usually be replaced by writing to the manufacturer for replacement parts. There is usually a small charge for the replacement part unless the pan is still in warranty.

Sometimes people wonder if their pans should be bought as a set or individually. If money allows, usually a

set is a better buy, since over the long run the individual pieces will cost more than the set. However, if a person has certain cooking needs, the purchase of individual pans may be warranted. For example, if one primarily cooks for only two and does not foresee a need for a five-quart dutch oven and would not expect to use the twelve-inch frypan in the set, it would probably be wiser to buy the one and two quart saucepans and eight-inch frypan in the set as individual pieces.

Finally, buy the best quality pans your budget will allow. Good pots and pans are expensive, but they should last a lifetime.

### **Trends**

Changes in the way we cook, and methods used are influencing choice of materials for utensils. The microwave oven is used in almost 40 percent of the households today as a primary source of food preparation. Glass, plastic, and paper are used rather than metal in the microwave oven. The new solid disk heating elements require utensils with flat bottoms, good conductors of heat at least over base of the utensil. Iron or steel are required as the base metal for use with the new induction range.

Iron or steel utensils are needed to create a magnetic field and supply heat to the pan. Heat is transferred from the pan to the food. Little or no heat is retained on the surface. The induction range, though more expensive than conventional range, is energy efficient as all the heat is transferred from the pan to the food.

You may want to consider adaptation of cooking utensils to best utilize the heat source in present and future cooking designs.

The author acknowledges materials adapted from *Cookware Making a Wise Selection* by Ann Langenfeld.