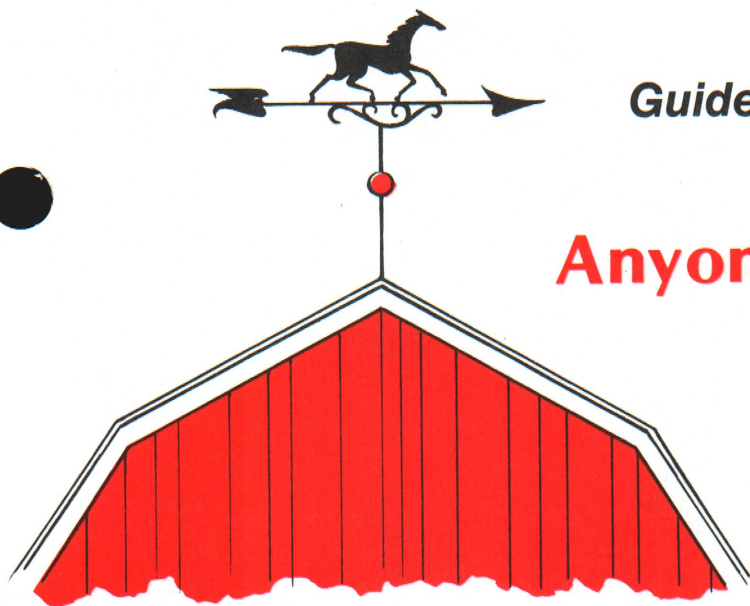


FARMING KNOW-HOW

Guidelines to Better Family Farming

Anyone For A Few Broilers?



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Broilers are the young tender birds that broil, fry or barbecue so easily and taste so good. Broilers (1) are easy to raise, (2) grow rapidly, (3) do not take much care and (4) require little equipment.

THE BROILER INDUSTRY

There are many breeds (Plymouth Rock, Leghorn, Orpington, etc.) and varieties (White, Red, Barred, Black, Single Comb, Rose Comb, etc.) of chickens. Such breeds and varieties were not bred for either egg or meat production and were developed before 1930. They have been kept alive by fanciers, people who keep chickens for fun—and maybe some profit. Fanciers often display their unusual birds at fairs and poultry shows.

The broiler industry really started to develop in the mid-1930's. It was developed by breeders from "dual purpose" type birds such as the Plymouth Rock, both White and Barred and the New Hampshire and the Cornish. Since then the chicken business has split into two specialties—meat (broilers) and egg production. Different birds, breeds, varieties and strains are used—no one bird (strain, variety or breed) produces both meat and eggs in quantity.

Broilers have become big business since that division took place. In 1934, the first year the USDA reported broilers, 34 million were raised. By 1970, almost 100 times that many (3 billion) were raised in the United States.

Some of the major strains of broilers that are now available are Cobbs, H and N, Shaver, Hubbard, Pilch, Arbor Acres and Vantress. These birds have all been

developed during the last 35 years. They grow and feather rapidly, and produce white meat in abundance on as few pounds of feed as possible. *Standard bred or egg production bred birds will not do!* A broiler used to grow to 3 pounds live weight in 15 weeks on 15 pounds of feed. It now grows to 4 pounds live weight by 7 weeks of age on 8 pounds of feed! This means that 2 pounds of feed produces one pound of broiler.

The broiler industry has become very specialized. It is concentrated in the southeastern states of Maryland, Delaware, Georgia, North and South Carolina, Virginia and the southern states of Mississippi, Louisiana, Arkansas and Texas.

PROGRESS

Since 1950, the MSU Poultry Science Department in cooperation with the state Department of Vocational Education has sponsored the FFA (Future Farmers of America) Meat Efficiency Contest. The information presented in Table 1 gives some insight as to what has happened in the growing of broilers based on broilers entered in the FFA Broiler Contest since 1950. The important columns in Table 1 are Contest Length, Body Weight and Feed Efficiency. They show the progress students have made since 1950 which parallels the accomplishments of the commercial broiler grower in the United States.

Progress has really been made in the rate of growth. In 1950, the contest ran for 13 weeks; it had dropped to 7 weeks in 1971 and 6 weeks by 1978. Thus, it takes less than half the time to produce broilers today that it did 30 years ago. The body weight column shows that birds are still marketed at about the same weight

Table 1. Average Weight, Feed Efficiency and Mortality of Broilers Entered in Michigan's FFA Broiler Contest (1950-1977)

Year	Contest Length (wks.)	Number Entries	Body Weight (lbs.)	Feed Efficiency (lbs.)	Mortality (%)	Birds Started
1950	13	8	3.86	4.25	6.8	1,360*
1951	12	12	3.64	3.74	4.7	2,040*
1952	12	28	3.67	3.46	4.8	5,020
1953	11	20	3.30	3.10	4.1	3,580*
1954	11	73	3.60	3.31	4.0	11,665
1955	10	41	3.41	3.14	4.2	6,618
1956	10	52	3.46	3.04	2.8	7,489
1957	10	54	3.63	3.04	3.7	7,067
1958	9	55	3.52	2.73	4.0	7,199
1959	9	41	3.51	2.65	4.4	5,163
1960	9	49	3.56	2.75	5.6	6,163
1961	8	62	3.34	2.44	2.7	8,610
1962	8	47	3.30	2.48	3.2	5,340
1963	8	47	3.35	2.55	4.3	5,767
1964	8	54	3.50	2.44	3.5	7,567
1965	8	53	3.61	2.58	6.4	6,444
1966	8	60	3.69	2.44	4.37	8,074
1967	8	52	3.61	2.48	4.83	7,279
1968	8	59	3.81	2.57	4.32	8,657
1969	8	58	3.73	2.64	7.36	7,722
1970	8	70	4.02	2.90	5.90	9,787
1971	7	90	3.45	2.48	6.18	12,085
(spring)						
1971	7	81	3.53	2.48	6.24	10,140
(fall)						
1972	7	108	3.38	2.20	2.76	11,969
1973	7	304	4.00	2.20	2.0	34,601
1974	7	204	3.60	2.50	4.0	23,733
1975	7	261	N/A**	N/A**	N/A**	32,981
1976	7	296	3.90	2.5	5.0	28,698
1977	7	278	4.10	2.4	6.0	28,685

*Estimated number

**Not applicable

(3.25-3.75 pounds per bird). The feed efficiency column shows that birds are grown today at less than half as many pounds of feed per pound of gain.

The changes shown in Table 1 are at least part of the reason that consumers can buy ready-to-cook broilers in the retail store at reasonable costs. Broilers are sold to the consumer today at a lower cost per pound than in 1950—in spite of increased costs and inflation.

WHERE AVAILABLE?

Order broiler-type chicks from a hatchery. The MSU Poultry Department, 132 Anthony Hall, Michigan State University 48824, can refer you to hatcheries able to supply your needs. The National Poultry Improvement Plan, USDA-ARS, Animal Improvement Lab, Beltsville, Maryland 20705, has a more complete list of hatcheries and their offerings.

Order broiler chicks by strain name. Although chicks are sometimes given away free, these are day-old male chicks and are culls from day-old laying

breeds. Beware! They will neither grow fast nor lay eggs. Even if only a few broilers are raised for your own use, purchase good chicks and order them for the summer growing period. They should arrive in May or June, and 8 to 10 weeks later be in the freezer.

CARE

Baby chicks need care! They need heat! They need attention! The heat source that most people use is a heat lamp, because a 100- or 150-watt incandescent lamp will provide heat for only a few chicks. Heat lamps, however, use 250-watt clear or red bulbs (Figure 1) and are used as chick brooders or as baby pig brooders. A lamp is suspended 18 inches off the floor or litter to provide heat for up to 300 baby chicks. Two lamps are good for insurance (one may go out). You can tell if the chicks are comfortable by their actions. Comfortable birds will be in a band or circle under the lamps and cheep softly and settle down. Cold chicks will give out shrill chirps.

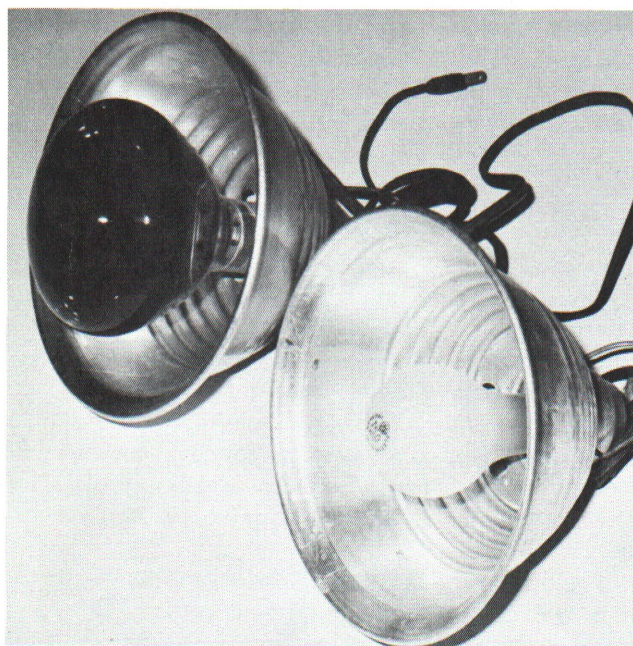


Fig. 1. Heat lamps used for chick brooders.

LITTER

Several different litters are satisfactory. Crushed corn cobs, wood shavings and straw (chopped straw if possible) are good because they are absorbent and will not pack as quickly as some others.

After the heat source (lamp) is hung and adjusted, put the litter down on the floor. Then rest your hand on the litter directly under the heat lamp. The back of your hand should feel warm (95°-105°F) but not hot; if the litter becomes too hot, it can burn!

FEED

Broiler feed is not just a chicken feed. It is different from regular chick starter and grower feed because it is higher in protein and energy and has been scientifically formulated and tested over many years. A broiler starter mash will contain 24 percent protein and 1,425 calories per pound of feed. It should be fed for the first four weeks. A broiler finisher feed will contain 22 percent protein and 1,450 calories per pound and should be fed for the rest of the growing period.

If a good broiler mash is not available, a reasonably good feed can be mixed using half chick starter (20-21 percent protein), half turkey starter (28-30 percent protein), plus 3 pounds of vegetable (cooking) oil per 100 pounds of mixed feed. The mash can be changed for the last part of the growing period to three-quarters chick starter, one-quarter turkey starter, and 4 pounds of vegetable oil per 100 pounds of mixed feed.

Table 2 shows what might be expected in live weight and feed and water consumption—if you have good birds and good feed. In 9 weeks you can expect 4,130 pounds of live birds if you start with 100 chicks; they will eat 9,120 pounds of feed.

A BROILER MANAGEMENT CHECKLIST

The following checklist gives specific management suggestions, but remember that nothing replaces tender loving care, cleanliness and/or sanitation.

1. **House Preparation** — Remove all litter and manure. Scrape, scrub and disinfect the house and equipment. Disinfectants will not take the place of a good cleaning.
2. **Chick Guard** — Place an 18-inch chick guard or corral (netting, paper, etc.) around the heat source about 3 feet from the edge of the hover or heat source to prevent the chicks from piling up in

corners until they learn where the source of heat, feed and water is located.

3. **Litter** — Provide 2 or 3 inches of a mold-free absorbent litter; cover with rough or crinkled paper inside the corral until chicks learn the difference between feed and litter, approximately five days (see Figure 2).
4. **Temperature** — Regulate the brooder temperature to the comfort of the chicks. A rule of thumb: 95°F at the edge of the hover or under the heat lamp 1 inch above the litter for the first week; thereafter, drop the temperature 5°F each week until it reaches 70°F. After five weeks, the ideal house temperature range is a minimum of 60°F and a maximum of 75°F. Raise the heat lamp to lower the temperature, as there is no thermostat to change the heat.
5. **Floor Space** — Allow .50 square feet of floor space per bird the first 3 weeks and 1 square foot of floor space for the remainder of the growing period (10 feet by 10 feet equals 100 square feet, or 100 chicks).
6. **Ventilation** — There should be enough draft-free ventilation to remove ammonia fumes and keep the litter dry.
7. **Vaccination** — Birds should be vaccinated for Newcastle disease and infectious bronchitis; obtain vaccine from a hatcheryman. A combination Newcastle disease and infectious bronchitis vaccine may be used in the water. You can buy Mareks vaccinated day-old chicks.
8. **Feeder Space** — Allow 250-300 linear inches (two 6-foot, 3½-inch deep troughs or three tube-type feeders) per 100 birds. Fill troughs no more than half full and tube (hanging) feeder pans (see Figure 3) no more than one-third full. Place tube or hanging feeder on floor for very young chicks and raise the feeder as they grow. Keep the lip of

Table 2. Average Feed Consumption, Water Consumption and Growth Rate of Broilers

Age in Weeks	Avg. Wgt. (lbs.)	Feed Conversion (lbs.)	Feed Consumption/100 Birds (lbs.)			Water Consumption/100 Birds (gals.)		
			Daily	Weekly	Cumulative	Daily	Weekly	Cumulative
1	0.23	0.70	2.3	16	16	0.5	3.5	3.5
2	0.47	1.11	5.0	35	51	1.2	8.4	11.9
3	0.82	1.37	8.5	60	111	2.0	14.4	26.3
4	1.23	1.58	11.7	82	193	2.8	19.6	45.9
5	1.72	1.72	14.4	101	294	3.5	24.5	70.4
6	2.29	1.85	18.3	128	423	4.4	30.8	101.2
7	2.92	1.94	20.5	144	567	4.9	34.3	135.5
8	3.52	2.08	23.8	167	734	5.7	39.9	175.4
9	4.13	2.20	25.4	178	912	6.1	42.7	218.1

the feeder level with the birds' backs as the birds grow. This will help to prevent feed wastage. Feed two or three times daily.

9. **Water Space** — Begin with three ½-gallon water fountains per 100 chicks. At three weeks, allow 40 linear inches or two 3-gallon fountains per 100

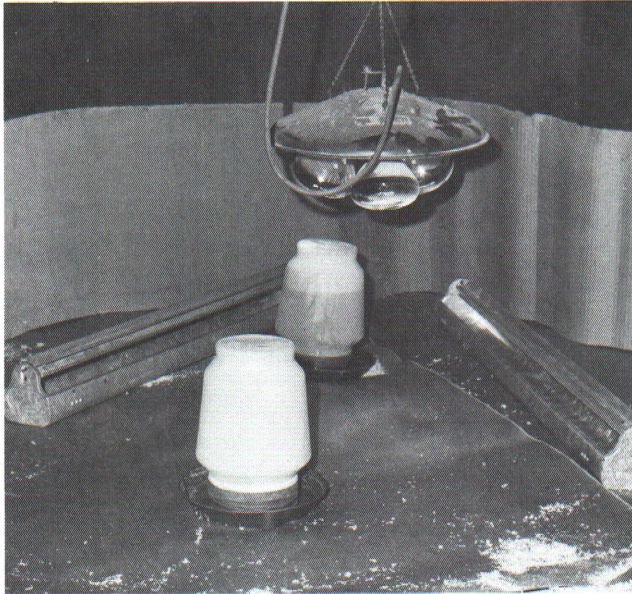


Fig. 2. Brooder ready for starting chicks.

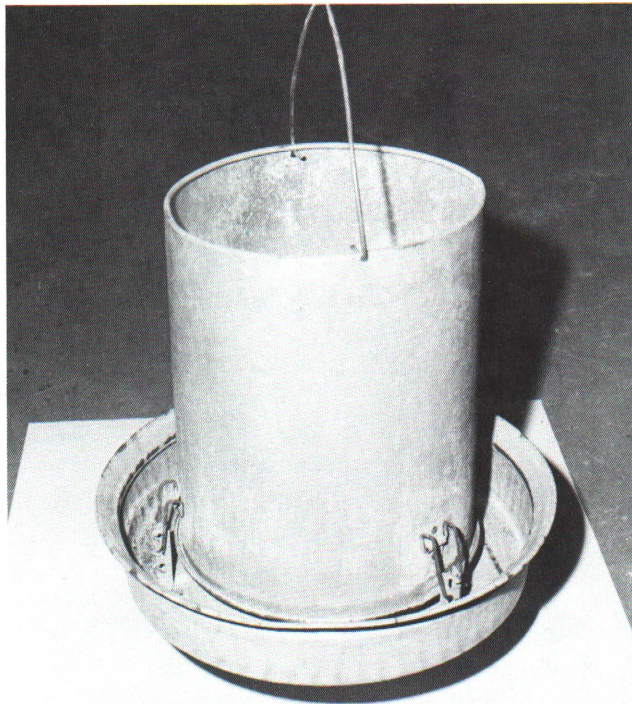


Fig. 3. Hanging tube feeder.

birds. (Smaller waterers (see Figures 4 and 5) are available for small flocks.) Place waterers so that birds will not have to walk more than 10 feet to obtain water. Keep lip of water trough or fountain level with birds' backs. Water stands that keep the birds up out of wet litter at the water fountains are good disease preventatives.

10. **Light** — Allow the birds a minimum of 12 hours of light per day with a minimum light intensity of 1 footcandle the first two weeks, after which the light intensity should be reduced to .25 to .50 footcandles.
11. **Debeaking for Cannibalism Control** — Day-old debeaking is usually more convenient—and sometimes may be done by the hatchery—but less effective than debeaking at 10-14 days old. To debeak, remove the upper beak two-thirds of the distance from tip to nostril opening and de-tip the lower beak (see Figure 6). Use a sharp pair of tin snips and a hot soldering iron to cauterize the wound. CAUTION: Don't burn the chick's tongue!

12. **Feed Program** —

	Age	Protein	Calories/ Pound	Ca	P
Broiler starter	0-4 weeks	24%	1,425	1.0%	0.6%
Broiler finisher	5-9 weeks	20%	1,450	1.0%	0.6%

13. **Disease Control** — Be sure that your chick starter contains a coccidiostat, for example, Amprol or Zoalene at the 0.0125% active drug level. A dry litter will also control coccidiosis!
14. **Brooder Space** — Each chick should be allowed a minimum of 7 square inches of brooder space under the hover. For electrical brooders, 10 square inches should be provided.

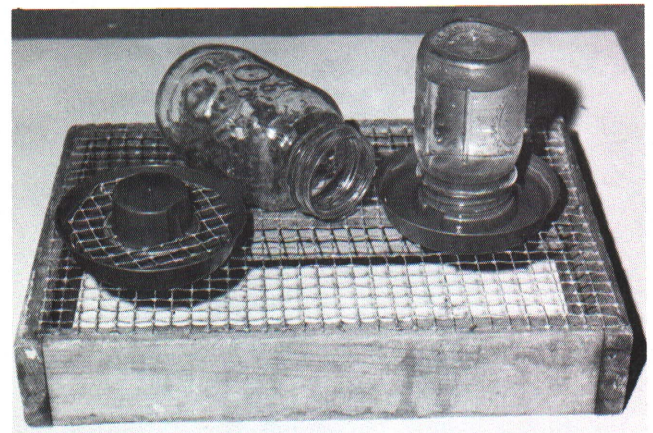


Fig. 4. Waterer for small chicks.

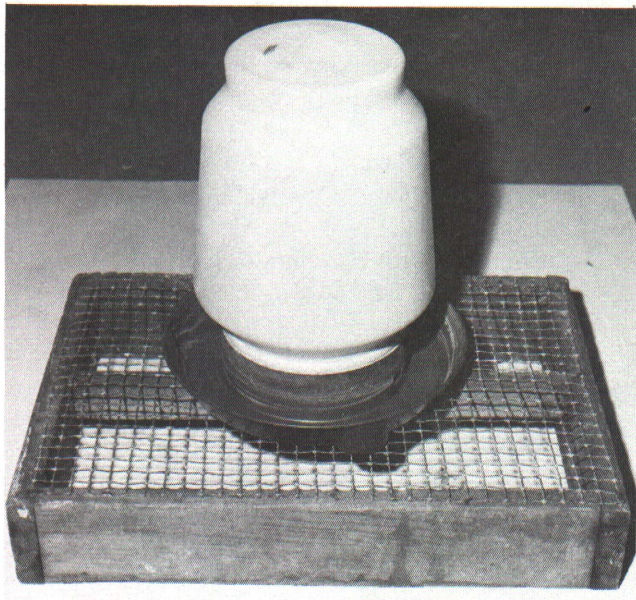


Fig. 5. Waterer for larger chicks.



Fig. 6. A debeaked and non-debeaked 10-day old chick.

NOW FOR A CHARCOAL BROIL

You have grown the broilers—now let's have a barbeque! It is not difficult to do. First, remove the feed from the birds for 12 hours (the night before) before you kill them. You will need a few things to do the killing and dressing (see Figure 7):

1. A rope with a one-inch block of wood tied on one end
2. A sharp knife

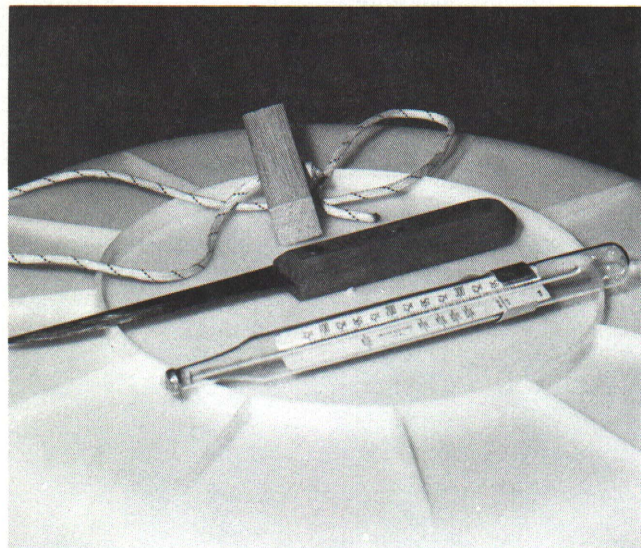


Fig. 7. Equipment needed for killing and dressing.

3. A bucket or tank of hot water (140°F)
4. A cleaning bucket or tank (new plastic garbage can) full of cold water for cooling undressed birds

Killing and Dressing the Bird

1. Hang the bird by using the rope and block as shown in Figure 8. The head of the bird should be at least waist high for ease in handling. Take the head in one hand with the comb in the palm, and cut one of the jugular veins that come down each side of the neck. If you hold the bird's head firmly at this time, it will bleed without throwing blood all over the area.
2. When the struggling stops, immerse the bird in the hot water (140°F) for 30 to 40 seconds. To help the water penetrate the feathers, move the bird up and down and back and forth in the water. Be sure that the temperature remains at 140°F for all the birds.
3. After scalding the bird, hang it up with the rope and block. The feathers will be easily removed by rubbing the bird. CAUTION: If the water is too hot, the skin will slightly cook and tear.
4. Put the bird into cold water (after the feathers are removed) to reduce the body temperature until you are ready to eviscerate it—assuming that you are going to kill and dress more than one bird.
5. When you are ready to eviscerate the bird, take it out of the cold water tank and lay it on a flat solid surface. Cut off the feet at the hock joint and remove the head.
6. Lay the bird on its side with the drumsticks pointing away from you. Split the bird open by cutting through the skin and bone parallel to but just

above or below the back bone. If you start just above or below the base of the tail and stop at the base of the neck, the bird will be split open along the back bone (see Figure 9).

- Cut around the vent and open the bird. At this point you will find that starved (12 hours) birds clean much more easily than birds full of feed. The intestines will come out of the body cavity easily with the whole bird opened up on the table before you. Pull the intestines toward you gently



Fig. 8. A broiler suspended for slaughter.



Fig. 9. A broiler positioned and split into two equal halves.

but firmly. The crop may also come out along with the intestines. (The crop is the food storage sack found in the neck of the chicken.)

- After the intestines, heart and lungs (imbedded in the rib cage) have been removed, you can easily split the bird into two halves. At the front (head) end of the keel, or breast bone, when looking at the flesh side, or inside, of the bird, there is a white cartilage. The cartilage is at the base of a V-shaped structure that comes down to it from the wing sockets. Nick this white cartilage with your knife and break back the V-shaped structure. The breast bone will peel out if you apply some pressure underneath the skin side. The bird can then be split or cut into two equal parts. Remove the neck and oil gland at the base of the tail.
- Clean and wash the gizzard, liver and heart and wash the two halves.
- Now you are ready to barbeque!

Charcoal Broiling Tips

- Most beginners use too much charcoal and the fire gets too hot.
- Most backyard grills do not allow enough space between the charcoal fire and the grill rack—and this almost guarantees burned chicken. Instead, start with less heat (lighted charcoal) and add more heat as you need it. When adding cold (unlighted) charcoal to the fire, wait for it to catch fire. This takes time. If you become impatient and add more the chicken will burn when the fire catches. Help control very hot fires by sprinkling them with water. Although this may cover the chicken with charcoal ash, it doesn't affect taste.
- Figure at least two hours to start a fire and cook chicken halves that weigh one pound each. If it is cold and the wind is blowing, it will take longer and use more charcoal. Have available at least one pound of charcoal for each pound of chicken to be cooked. Usually one-half pound of charcoal should be enough to do the broil; the extra half pound is insurance.
- The bird is done when the drumstick will revolve (come loose from the flesh) while holding the half chicken in one hand and turning the drumstick with the other. (Use gloves or a towel to protect your hands.)
- Barbeque grills clean more easily after being soaked between several layers of wet newspaper overnight.

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