Background Report Reference

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Title: Dry Roasting Almonds

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DRY ROASTING ALMONDS

This process consists of heating almonds in a rotating drum so as to gradually raise the temperature of the almonds until the desired degree of roast is obtained. The dry roasting cycle is much longer than for oil roasting, but the batches are usually larger, which compensates for the extra time required. Heat transfer to the kernel is slow and unless the heat is applied slowly, the drum will get too hot and char the skins and outer layers of the kernels before the centers are roasted.

The almonds being roasted should be free from foreign material and of reasonably uniform size. The small pieces and split almonds have a tendency to over roast, or burn, before the major part of the kernels have reached the proper color.

Almonds are roasted entirely to color and it has been found that the flavor which develops corresponds to the color of the roast. The reason for roasting almonds according to color is due to a large number of variable factors which are not easily controlled and because batch roasting apparatus has never been standardized. Some of these variables are the amount of moisture in the almonds, the B.T.U. value, and the amount of fuel used, temperature of the almonds entering the roaster, damper openings, etc.

It has been found that by roasting to the same color there is a variation of ten minutes, more or less, in the roasting time. It is also usual for the first roast of the day to take a little longer than subsequent roasts.

The Exchange's experience listed in the table below may serve as a guide.

In using a 500# roaster filled to capacity, with gas as a fuel, the average time required for a roast is shown as follows:

TIME	APPROX. TEMP.	COLOR OF PRODUCT	TYPE OF ROAST
1 hour	240° F.	Very light brown	Light
1¼ hours	245° F.	Light brown	Medium
1½ hours	250° F.	Dark brown	Heavy

The temperature was determined approximately by allowing the almonds to pour over a thermometer element not in contact with the roaster.

The most desirable degree of roast will depend upon personal tastes and the use to which the roasted almonds will be put. For use in ice cream, a heavy roast is sometimes desirable. For use in chocolate, or as salted almonds, a medium roast is best. Some confectionery uses may require a light roast.

EQUIPMENT REQUIRED

1 - roaster equipped with exhaust fan, elevator and feed bin.
1 - cooling bin equipped with suction fan.
1 - scoop shovel.

Practically all types of coffee, cocoa bean and peanut roasters have been used with fair results for roasting shelled almonds. The least satisfactory roasters are those with larger perforations and those which are internally fired so that the product is momentarily in contact with the flame. In our opinion, roasters with a revolving cylinder fitted with baffles, but with no perforations, are best suited for roasting shelled almonds.

Any fuel can be used to heat the roasters that is capable of being controlled during the roasting process, and when the roast is being discharged. It has been our experience that gas is the most satisfactory and the most easily controlled, as well as being one of the cleanest fuels.

Ample ventilation must be provided by a suction fan to remove all water vapor and other gases that are released during the roasting process, as well as removing combustion gases. The cooling bin with perforated bottom connected to a strong suction fan is necessary to rapidly cool the roast. Cool air must be drawn through the hot almonds as soon as they are discharged from the roaster to prevent further roasting or burning in parts of the batch.

Method

Start the motor on roaster and suction fan, light up, and allow the roaster to warm up from ten to fifteen minutes with a low fire. During this time the feed bin can be filled with a charge of almonds. This charge should be, when possible, the full capacity of the roaster and never less than half the capacity. When the roasting of small quantities is attempted in a large roaster, the result is often an uneven or scorched roast with a large amount of breakage.

At the end of the warm-up period, allow the almonds to flow into the roaster rapidly, turn up the heat to a medium fire and note the time.

As previously stated, you will roast for color only, but information as to how long the almonds have been in the roaster will assist you in properly adjusting the heat, etc. In about ten minutes, when the almonds have become warm, open the damper to the roasting chamber so as to exhaust the moisture and roasting gases being driven from the almonds. Check the progress of the roast carefully by withdrawing a few kernels with a large spoon and cutting them in half.

No change will be noted other than a softening of the meat during the first half of the roasting time. When about three-fourths of the roasting period has elapsed the almonds will begin to develop a faint brown color and the characteristic odor of roasting almonds will be noticed. From then on the roast must be sampled frequently as it is now developing rapidly. It may take only fifteen to twenty minutes for the roast to proceed from light through medium to a heavy roast.

When the interior kernels have very nearly reached the desired degree of roast, turn off the heat, start the large suction fan and immediately discharge the hot almonds into the cooling bin. Spread the meats to an even depth with a shovel so that cooling will be uniform. There will be a slight increase in the degree of roast during the first part of this cooling period.

If the roasted almonds are to be salted using a water suspension of gum arabic as an adhesive, this should be accomplished while the almonds are still quite warm to facilitate evaporation of the water. Otherwise, the almonds should be allowed to cool to room temperature before being packed in airtight containers.

When the last roast is finished, allow the roaster to rotate from ten to fifteen minutes to permit even cooling and reduce the danger of warping the cylinder.

REFERENCES 9 through 13

Reference 9 - See reference 2 of the AP-42 section 9.10.2.1

Reference 10 - See reference 8 of the AP-42 section 9.10.2.1

Reference 11 - See reference 5 of the AP-42 section 9.10.2.1

Reference 12 - See reference 6 of the AP-42 section 9.10.2.1

Reference 13 - See reference 7 of the AP-42 section 9.10.2.1