

## DRIED TOMATO FACTORY REPORT

# 1. INTRODUCTION

### *Types of Tomato Plants*

Different tomato plants obviously produce different types of tomatoes. But there are common categories that are obviously available and it is supposed they can all be subjected to some drying process but the pear shaped tomato( or paste tomato plant) is the ideal one. They are accordingly:

**Beefsteak Tomato Plants** - Commonly known as the "large-fruited" types, beefsteak tomato plants are capable of producing a slice that covers a sandwich. The fruit from this variety of tomato plant can easily weigh 2 or more pounds and usually ripen late in the season.

**Cherry Tomato Plants** - Known to most as the small round tomatoes that accompanies a garden salad, the cherry tomato plant produces a "cherry-sized" fruit (can be a little larger than a cherry). These types of tomatoes range in size from the dwarf style tomato plant to the seven-plus foot tomato plants. Typical cherry tomato plants produce excessively, so one plant per family is usually sufficient.

**Determinate Tomato Plants** - Exactly the opposite of the indeterminate tomato plant, these tomato plants have similar habits of growing to a certain size, yielding the fruit and then declining. Plants within this category of tomatoes generally ripen early in the season and are incapable of producing fruit for an extended period of time. This group is commonly referred to as compact tomato plants

**Dwarf Tomato Plants** - Also known as the midget or patio tomato plants, this variety of tomatoes produces cherry type tomatoes (1" diameter or less). Although these plants life cycle are short lived, they quickly produce tomato crops for a short period of time. Due to their compact vines and tight root structure, dwarf tomato plants can be grown in a hanging basket or small containers.

**Indeterminate Tomato Plants** - The most commonly grown tomato plants for the home gardener. Typically these plants grow all summer long and will continue until cut back or killed off by frost or disease. The success of these tomato plants is very dependent on the use of tomato cages and stakes in order to promote a more natural growing environment and keep the fruit of this plant from coming into contact with the soil.

**Paste Tomato Plants** - Less juicy than most varieties of tomatoes, the paste tomato plant offers a pear shaped fruit without a center core. Paste tomatoes are known for their meaty insides and very few seeds, making this tomato plant an ideal canned good.

**San Marzano** - The ultimate tomato for making pasta sauce.

**Other Tomato Plants** - From the relatively new winter storage tomato plants to low temperature growing tomato plants to orange, yellow, pink or multi-color fruit bearing tomato plants, the tomato varieties can be endless. Through different trails and personal experiments, gardeners and botanists will continue to cross breed tomato plants to create the next generation tomato.

## **2. DRYING OF TOMATOES**

Drying is the oldest preservation method, traditionally requiring only the sun's energy over several days. It is a very simple process. All you are doing is removing the water from the fruit, leaving all the vitamins, minerals and flavour.

For centuries Italians dried tomatoes in the sunlight on the clay tiles of the roofs of their homes. In order to sun dry tomatoes in the traditional way, you need ideal weather conditions - long, hot, sunny summer days with a gentle breeze and low humidity. For those with less than ideal weather conditions, tomatoes may be dried in an oven or a dehydrator.

### **How to dry tomatoes**

Lucky for tomatoes, they become ripe when the weather is hottest and driest. This means you have the choice to dry tomatoes outside under a hot sun or indoors in an oven, food dryer or convection oven (not a microwave oven). Pear-shaped tomatoes are best for drying, since their solid content is high and water content low. Most other tomatoes are unsuitable for drying. Beef-steak tomatoes in particular are so watery that after drying, all that's left is some papery skin.

A picture of pear shaped tomatoes



### **3. REPARATION FOR ALL TOMATO-DRYING METHODS:**

Wash and dry tomatoes. Split lengthwise, remove seeds but leave as much pulp in the center as possible.

Quarter large tomatoes. Remove any white, stemmy portions or black spots.

#### **a. To dry outdoors**

Place the tomatoes cut side up on a dryer or oven racks taken outdoors. You can sprinkle tomatoes lightly with salt for flavor and hasten the water-extraction process, but it isn't necessary for preservation purposes. In the case of drying, the preservation method is simply the removal of water.

Place the dryer or rack on a piece of plywood. Leave room between the rack and the wood for air to circulate. To protect tomatoes from insects and airborne debris, cover with cheesecloth or nylon netting supported so fabric won't stick to the tomatoes. A dryer can be made out of two simple wooden frames with screen or double thickness of netting stapled to the frames.

It may take two to three days for sun-dried tomatoes to become completely dry. Take them in at night. Halfway through drying, flatten the tomatoes lightly with a rubber spatula.

If you are unable to complete the drying process outside, finish drying in the oven. Drying is a continuous process. You can continue to dry tomatoes you've semidried, refrigerated and put out to dry again until pliable. To eliminate any insect infestations, freeze the tomatoes in vapor-resistant bags for 48 hours.

### **b. To dry in a dehydrator or convection oven**

Follow preparation directions. Set temperature at 140 degrees F. Place the tomatoes cut side up on rack.

Sprinkle lightly with salt.

Place tomatoes in the oven with the door ajar so air can circulate for about six hours, or until completely dry. Lay a sheet of aluminum foil on the bottom of your oven to catch drips. Halfway through drying, flatten with a rubber spatula, watch for curling on the edges, and rearrange tomatoes often.

## **4. HOW TO STORE DRIED TOMATOES**

Place the dried tomatoes in vapor-resistant plastic bags (be sure to press the air out of the bags) or canning jars with lids. If using jars, place duct tape around the closure so that no infestation can occur. When ready to use, remove amount desired and re-tape; keep out of light. You may keep them at room temperature in these containers, but for better stability and longevity, refrigerate or freeze. Freezing helps to preserve for a longer time period and keeps the tomatoes a bright red color. Good spoilage prevention includes freezing the product for 48 hours.

## **5. THE U. C. DAVIS METHOD FOR PACKING DRIED TOMATOES IN OIL**

If you'd like to pack dried tomatoes in oil, follow these steps:

After the tomatoes are dried, it is recommended that you place them in a bowl and sprinkle with diluted (one part vinegar, one part water) distilled white vinegar. This acidifies the tomatoes and also adds back some moisture, for a chewy texture.

Empty the bowl onto paper towels and pat tomatoes dry.

Pack tomatoes lightly into clean pint or half-pint jars. At this stage you may add herbs or spices, dried only. Cover with oil to ½ inch of the rim of the jar. At room temperature, oil may become rancid. This is not unsafe, but undesirable. If garlic is desired, U.C. Davis recommends acidification of the garlic by marinating with fresh herbs and vinegar 24 hours, checking to see if vinegar has completely penetrated before putting in oil.

## **6. HOW TO USE DRIED TOMATOES**

The uses for tomatoes are numerous. Think of them any time you want to add intense tomato flavor. Chop and toss in pasta sauce, soup, rice, casseroles, chili, mayonnaise or a light sauté with vegetables. Add dried tomato bits to stir-fries so they make contact with moist heat, and powerful tomato flavor can be yours. Again, if too dry, plump in warm water for a few minutes.

## **7. HEALTH BENEFITS OF SUN DRIED TOMATOES**

### **Sun Dried Tomatoes Provide These Nutritional Benefits:**

- A 100% vegetable product contains virtually no fat and no cholesterol, is low in sodium and naturally low in calories.
- Sun Dried Tomatoes, packed in 100% pure olive oil (or a combination of olive and canola oils), contains no cholesterol. Olive oil is high in monounsaturated (good) fats, which studies confirm helps reduce the risk of heart and inflammatory diseases. Canola oil is also considered a “healthy” oil.
- Sun Dried Tomatoes are a natural source of Vitamins A and C. Vitamin A is a recognized antioxidant compound. Antioxidant-rich foods may help protect cells, thereby lowering the risk of cancer, diabetes, and heart and lung disease.
- Lycopene, a micro-nutrient found in cooked or condensed tomatoes, was cited as reducing the risk of heart attack by as much as 50% in a November 1997 study published in the American Journal of Epidemiology.

## **8. DRYING OF TOMATOES ON A LARGE SCALE: A FACTORY SCENARIO AND OPERATIONS OF SUN VALLEY OF CALIFORNIA WITH THE NARRATION BY CEO, ROBERT BENECH.**

- Valley Sun Products contracts with the largest tomato grower/processor in the Central California area during December of each year to assure that the best tomatoes are planted for drying.
- Our growers observe strict State and Federal safety guidelines in growing the tomatoes for Valley Sun Products to assure they are of the finest quality and that they conform to Valley Sun Products' requirements. You can be sure the tomatoes are safe, unlike some foreign suppliers' products!

- Our tomatoes are harvested at the peak of their maturity and transported in gondolas specially designed for the gentle transport of tomatoes. Each load is inspected by the State of California to provide independent evaluation of quality. In addition, Valley Sun's agreement with the grower allows us to carefully select only the highest quality tomatoes available for each day.
- The tomatoes are rushed to the plant for processing to assure that they maintain their flavor and color. Even after the tomatoes arrive at the plant, Valley Sun's Quality Assurance personnel again inspect the tomatoes and send those trucks back which don't meet Valley Sun's high standards of quality.
- The tomatoes are gently removed from the gondolas with water, which minimizes damage during unloading and begins the process of washing & sorting.
- The tomatoes go through several washing stations, each followed by fresh water rinses, so that the tomatoes are clean before they are cut. An electronic color sorter and trained sorting staff removes any tomatoes that are not at the peak of ripeness, are too small or damaged.
- State-of-the-art high-speed machines slice each tomato and specially designed conveyers move the cut tomatoes onto Valley Sun designed drying trays. Each tomato is checked to ensure the cut side is up, allowing the tomatoes to dry properly.
- The trays are stacked onto pallets and the pallets are placed in sulfur rooms where the tomatoes are cured prior to drying, much like a smokehouse. Valley Sun uses elemental sulfur dioxide which helps maintain the bright color of the tomato inhibits microbiological growth during the drying process and contributes to the flavor of the product.
- After sulfuring, the pallets are moved to the fully paved and fenced drying yard and each tray is laid out to allow full exposure to the sun. The sulfur slowly evaporates from the tomatoes, to very low levels, only enough to enhance the tomatoes' tangy sweet flavor and bright ruby red color.
- Over a period of days (4-10) the rays of the sun dry the tomatoes. The slow gentle drying process imparts that special flavor so distinctive of authentically Sun Dried Tomatoes.

- When Quality Assurance personnel determine the tomatoes have been Sun Dried to the optimum moisture level the tomatoes are removed from the trays. The tomatoes are color sorted by an electronic color sorter and mechanically sized. A new x-ray sorter has been installed to remove other non-tomato defects (stems, pebbles and pieces of wood).
- After the initial sorting, the tomatoes are placed in large bins, lined with poly bags, and frozen to maintain color and flavor. Sun Dried Tomatoes must be treated with care and should be considered semi-perishable (like many fine gourmet foods).
- Throughout the year when orders are received, the Sun Dried Tomatoes are brought out of cold storage and sorted again by skilled workers who have been trained to remove those tomato pieces that would not be acceptable to our customers.
- According to our customers' specifications, the Sun Dried Tomatoes may be julienned, diced, chopped or powdered and may be packed in a number of different manners. We are Kosher certified by the Orthodox Union, an organization with the most stringent quality standards.
- To assure that each customer receives our Sun Dried Tomatoes in superior quality condition, the final product is rushed to its destination by refrigerated trucks or overnight service.

## **9. SUPPLY CHAIN ANALYSIS**

### **HARVESTING, GRADING, PACKING AND MARKETING OF TOMATOES CONSIDERING LIMPOPO AS THE FOREMOST PRODUCER NATIONALLY.**

The harvesting, grading, packing and marketing costs of tomato production are generally at least as high as the pre-harvest costs and, with a good crop, may be more than double the figure.

The financially more successful growers, apart from producing high yields of good quality, also tend to pay more attention to marketing.

Better supervision of labour during harvesting, grading and packing can improve productivity, thus reducing costs. It can also result in better grading, better presentation of the product and thus better prices being achieved.

Apart from the supply and demand situation, the quality of the fruit offered for sale, as well as its presentation, largely determines the prices achieved. Apart from colour and ripeness, the quality is highest at picking, and every effort should be made to retain this quality for as long as possible even for drying purposes. The fruit, especially of the table cultivars, is much more

perishable and easily damaged than is generally realised. Bruises or scarring caused by rough handling may not be immediately apparent, but often show up only after the fruit has reached the market, or ripened up fully. This may cause down-grading or reduce "eye appeal", and result in lower prices being realized.

The fruits should be picked, graded and generally handled with great care, so that as little damage as possible is caused. Growers should, periodically, make a point of inspecting their product at the point of sale, and comparing it with other consignments on offer, to assess whether or not they need to pay more attention to any marketing aspect.

#### **a. Harvesting**

The stage of maturity at which the fruit is picked, as well as the intervals between picks, is determined by several factors. For distant markets or where there are large time delays between picking and marketing, the fruit needs to be harvested at a less mature stage. This also applies under high temperature conditions, which hasten fruit ripening and deterioration. The market preference also plays a role; processors (including the tomato dryers) and certain communities prefer fully coloured fruits, whereas most retail outlets favour less mature fruits. Tomatoes are picked at the following stages of maturity:

**The pale green stage;** fruits which have reached this stage of development will continue to ripen internally, as well as develop the characteristic red colour of ripe fruit, whereas less mature fruits will never ripen or colour up properly. These fruits have a pale green colour, particularly around the blossom-end of the fruit, the contents of the seed cavity are jelly-like and fill the entire seed cavity; the hard dry appearance will have disappeared. It should be possible to cut such fruits in half with a sharp knife, without cutting the seed which should simply push aside into the softer flesh. By cutting a few fruits occasionally, and noting the difference in skin colour between the pale green stage and less mature fruits, pickers can be taught to recognise fruits that are ready for harvest. Great care must be taken not to harvest immature fruits, as these will not ripen satisfactorily.

**The early light-red stage;** fruits at this stage have just begun to show a red tint, usually at the bottom end, but sometimes on the sunny side of the fruit.

**The light red stage;** at this stage of maturity, virtually the entire fruit shows a rosy or light-red colour. During continuous cool weather it is sometimes advisable to pick tomatoes at this stage for sale at relatively nearby markets. However, colour development is rapid at this stage of development under hot conditions, and the danger exists that a portion of the crop may become over-ripe, particularly during harvest peaks, and over holidays or weekends. Long shelf-life tomatoes are not picked earlier than this stage.

**The red or ripe stage;** the greater portion of the fruit has developed the full red colour, but should still be firm, without any signs of softening (and ideal for drying purposes). Daily picking is essential, and should be used only for nearby markets where the demand is for fully coloured fruits.

Fruits of the desired maturity are picked by hand. Lug-boxes, baskets or other suitable containers are used for gathering the tomatoes and transporting them to the grading and packing shed.

### **b. Grading**

After picking, the fruit is generally graded according to size, either mechanically or by hand, as well as by colour and quality. First grade fruits must be sound, free from diseases, cracks, blemishes, foreign matter or spray residues, and be well-shaped and uniform in size and colour. Well-graded fruits will generally command better prices on average than ungraded fruits. It is usually better to grade too strictly rather than too leniently.

Uniformity of the grade is most important.

### **c. Packing**

Each size, colour and quality grade is packed separately for marketing. The material used for packaging must be new, clean and of such a quality as to properly protect the fruit during transit and marketing. The general appearance of the container should enhance rather than detract from the appearance of the consignment, because price can be affected by eye-appeal. The better grades of fruit are usually packed tightly in standard tomato trays (wooden boxes or cartons), in a specific pattern determined by fruit size. Lower grades are usually jumble-packed into similar containers.

### **d. Marketing**

Marketing is one of the most important aspects of production and sales, and yet it often receives the least attention. Market research is essential for successful marketing. One should know which market outlets are financially the most rewarding, the size of the markets, who the potential customers are, what fruit size, colour and general quality they prefer, how they want it presented, whether cartons, wooden trays, lugs or other containers are preferred, whether or not the product needs to be carefully graded or packed, whether or not highly-coloured, attractive labels are likely to command better prices, and so on. One should weigh up the merits of using fully made-up trays or making one's own, or the use of own transport compared with transport contractors. Many aspects need to be considered.

Having gathered this information one should concentrate on meeting these needs. This might possibly require a change in cultivars grown, or changes in cultural practices, such as times of planting. Market research should be on-going. Periodic visits should be made to various market outlets to assess needs, to compare one's standards of quality, grading, packing, trays, and labeling with those of one's competitors, and to try to ascertain whether or not any changes are called for.