



## ■ Efficacy and function of macadamia nuts

### ■ Invigorate brain and intelligence

Human brain cells are made up of 60 percent of unsaturated fatty acids and 35 percent of proteins. The first nutrient needed for brain development is unsaturated fatty acids, and macadamia nuts contain a lot of unsaturated fatty acids. It also contains 15 to 20 percent of high-quality protein and a dozen important amino acids, all of which are the main components of brain nerve cells. Regular consumption of Hawaiian fruit is good for improving brain nutrition, especially for pregnant women and children.

### ■ Lowering blood lipids

It has the nutritional value of regulating blood fat and blood sugar. It can effectively reduce the content of serum total cholesterol and low density lipoprotein cholesterol in plasma. It is very useful for human health to often eat the summer and free nuts to soften the blood vessels and reduce the incidence of heart disease and hypertension.

### Beauty and skin care

Macadamia nuts contain a variety of plant essence can moisturize the skin, increase vitality, especially rich in the diet of the lack of folic acid, riboflavin to the human body has a significant effect on women's health care and beauty.

## ■ Basic introduction of macadamia nuts

Macadamia nut is also known as macadamia nut or volcanic beans ,taste sweet and delicious , is a native of Australian tree nuts,taste sweet and delicious . Macadamia nuts are extremely rich in nutrients, with an oil content as high as 60,800.They are also rich in calcium , phosphorus , iron , vitamin B1 , B2 and amino acid, The delicious food with "dry fruit queen", of course, its function not only manifests in the nutrition value aspect, its regulation blood fat function is also very good, is very suitable for the old person or the blood lipid bad person's nourishing food.

Macadamia native to southeast Queensland, Australia, bordering New South Wales, was discovered in 1857. Hawaiian fruit was introduced to Hawaii in 1882, developed rapidly after 1946, and was successfully cultivated and improved in 1956.

Australia began to develop actively in the 1960 s. Countries and regions growing Hawaiian fruit in the world today include Hawaii, California, Florida, Central, South America, East, South Africa and Southeast Asia in the United States.

However, the major producers are still the United States and Australia, among which the United States is the largest producer of macadamia nuts in the world (Sichuan Forestry Department, 1998-1999), with annual fruit production of nearly 30,000 tons and sales value of about 300 million US dollars in the past two years. According to the statistics of 1997 (Sichuan Forestry Department, 1998-1999), the annual fruit production is 22000 tons and the sales value is 19.12 million US dollars.

We chat



China introduced macadamia nuts to Taiwan in 1910, and introduced macadamia nuts to Taiwan in 1940, but the number was not large. It was only around 1980 and in the early 21st century that a large number of macadamia nuts were introduced into Taiwan. Now Sichuan, Guangdong, Guangxi, Yunnan, Fujian are cultivated, and Zhejiang and Hainan have a small number of trial varieties. The total cultivated area is about 1000hm<sup>2</sup>. At present, most of them are in the stage of young tree or early fruit, and the fruit yield is less. From the results of a wide range of trials and studies, the introduction and planting of macadamia nuts in the subtropical and northern tropical climates of China are successful.

## ■ Processing technology of macadamia nuts

### ■ Exfoliation

Within 24 hours after harvest, macadamia nuts should be removed from their fibrous skin to reduce the warm respiration of the fruit and to accelerate the drying of the fruit. These peeled skins are usually recycled as organic fertilizer, and macadamia nuts with shells are sent to nut processing plants for processing.

### ■ Dry beside or over a fire

Careful drying is a key part of the macadamia processing process, which directly determines the preservation period of the fruit and the taste and quality of the final product. The fresh harvest macadamia nuts contain up to 30% of the moisture. The drying process takes about three weeks (about 20 days), which can reduce the water content to 2% to 3%, and the fruit will be reduced to the inside of the shell, separating from the inner wall of the shell, it will not damage the kernel.

### ■ Broken shell and sorting

Although macadamia nuts were native to Australia, the early ways to deal with them were the slow, handmade, broken shells of these fanatics, and it was not until 1954, when the first commercial macadamia shelled process appeared, Modern machines have greatly improved the industry history of macadamia nuts, removing the once-hard shell from the outside when the nuts are intact. The machine has a fixed blade, a movable cutting blade or a linkage roller and a pedestal for pressing the shell, and sorting it according to the quality of macadamia nuts.



## ■ The best drying technology for macadamia nuts


In addition, the initial drying temperature should be determined by the moisture content of the nuts with shells. If the moisture content of the nuts is 25% -28%, the drying temperature should not exceed 30 °C; if the moisture content of the nuts is 15% -20%, the drying temperature should not exceed 38 °C; if the moisture content of the nuts is 10% -15%, the drying temperature should not exceed 45 °C; if the moisture content of the kernel is 7- 10%, the drying temperature should not exceed 50 °C; otherwise, during baking, the shell will break and the kernel will turn brown and reduce the quality of the product.

## ■ Common drying methods of macadamia nuts

There are many ways to dry macadamia nuts, such as screen drying, hot air drying, and heat pump drying. One of the main disadvantages of these methods is that the drying time is long and the moisture content decreases slowly. During the drying period the high moisture content macadamia nuts contact with oxygen in the air for a long time and the peroxide value is high and the rancidity is increased. The dried macadamia nuts were dried with blower forced air drying and hot air drying at different temperatures. The quality of dried macadamia nuts was evaluated by water content, reducing sugar content, browning and peroxide value. Determine the effect of moisture content and drying temperature on the quality of macadamia nuts.

Comparison of domestic silo drying equipment and barrel net belt drying equipment

Quality comparison table of silo drying and mesh screen drying methods for macadamia nuts		
parameter	silo drying commodity	sieve drying commodity
Water content/ %	1.5	4.6
Browning rate/%	2.3	2.9
Reducing sugar/%	0.04	0.07
Peroxide value/ (meq.kg <sup>-1</sup> )	1.125	2.010
Total drying time/d	6	18



Compared with screen drying, silo drying (combined with blower forced air drying and hot air drying) can significantly reduce the moisture content of fruit with shell and shorten the drying time. During the drying process, the oxidative rancidity, browning rate and reducing sugar content of macadamia nuts were significantly reduced, and the quality of macadamia nuts was improved. In addition, post-harvest silo drying with macadamia nuts is a very important step to prevent hydrolytic rancidity and mildew. Therefore, the effect of silo drying is better than screen drying.

To sum up, the suitable conditions for drying macadamia nuts with shell in silos are as follows: the moisture content of macadamia nuts with shell can be reduced from 23.25% to 8.10% by forced air drying under 38 °C for 72 h; The moisture content was reduced from 8.10% to less than 1.5% for 72 h by hot air drying at 50 °C, which reached the drying standard.

The browning rate, reducing sugar content and peroxide value of macadamia nuts dried in silos were 2.3, 0.04 and 1.130 meq / kg respectively. The drying time of macadamia was shortened and the quality of macadamia was improved by the combination of blower forced air drying and hot air drying. But the height of the silo is relatively high, requiring a large amount of power for the intake fan to penetrate the nuts. In order to better solve the problems of uniformity, drying quality, and power consumption of the nuts, Dongguan Yonggan Energy-saving Technology Co., Ltd has designed a new drying equipment, which combines the advantages of silo and net drying. Formula: high efficiency heat pump dehumidifier set of positive and reverse flow chamber drying.



### Practical Application of Dryfree High efficiency Heat pump Dehumidifier

- Roast room capacity: 40 tons.
- Efficient dehumidifier: two.
- Lifting machine: one.
- Macadamia nut drying cycle: cycle baking, a cycle of seven days.
- Drying cost: 0.30 yuan per catty.

#### Advantages of a New Macadamia drying system with Dryfree High efficiency Heat pump Dehumidifier

- Output and quality objectives: Since the installation of the equipment, the temperature and air volume have reached the production demand, and the current production and quality requirements have been realized.

#### Security targets

Because the high temperature dry air produced by the high efficiency heat pump dehumidifier group is not dried by the heating of the electric heating tube and the infrared temperature is produced, there is no combustion source, so the danger of combustion and explosion can be avoided.



#### Energy saving targets

It can be seen from the actual use that the heat pump equipment can obviously reduce the power consumption and the loss rate of the equipment should be obviously reduced after the use of the heat pump equipment.

#### Environmental objectives:

High efficiency heat pump dehumidifier unit drying technology also has another feature, there is no harmful gas efflux.

#### Efficiency objectives

The high efficiency heat pump dehumidifier group, after the ambient air is dehumidified by the evaporator, the ambient air is drier, which can reduce the moisture content of the fresh air. After heating, the high air is fed into the baking box. The whole temperature in the baking box can reach 48-50 °C stably, the air is desiccated, it is dry air, and the baking efficiency is improved greatly.

## Macadamia Nuts Dryer

