
Low temperature decompression drying process

We finally arrived at the method of “**low temperature decompression drying**” for assimilating the greatest quantity of food materials.

The fundamentals food drying processes of our company are to preserve **the nutritional value, color and scent**.

The most important thing is how to evaporate the fluid efficiently at **low temperature**.

The points of the process are as follows.

- Enhance **the evaporative power** while lowering the boiling point by **reducing the pressure**.
- **Circulate the low-temperature wind** efficiently without raising the temperature for not more than **50°C** .
- Grasp the proper temperature for the heatedness of the food

With this processing method, raw material receives less damage(stress), which makes it possible that the color of the food remains bright and the flavor and the tastes are condensed.

For successful product,

- **the level of water activity** involved in storage stability should be not more than 0.5

Longstanding traditional way is just amazing. Ingenuity for preservation at normal temperature such as solar drying, salting and sugaring empirically-decreased the level of water activity.

For more information,

→JAPAN FOOD RESEARCH LABORATORIES (http://www.jfrl.or.jp/jfrlnews/files/news_no38.pdf)

- check the moisture content and the time at the point when the dried product can't discharge moisture any more.

For instance: Dried tomato



raw tomato

semi-dried

dried

(moisture content: approx. 35%)

(moisture content: approx. 20%)

- Slice raw tomato in 5mm and put them in the dryer = **moisture content 92%**
- Start drying at the temperature of **38°C**, then change the temperature zone into 5 levels such as, 2 hours later **40°C**, 4 hours later **43°C**, 6 hours later **46°C**, 8 hours later **48°C**. (moisture content depends on sugar content, size, variety and season).

- The time necessary for drying: 20 hours.
- The level of water activity : 0.34 (Ref: PDF).

The level of the moisture content seems highly, however microbial putrefactive bacteria don't grow. Because it is impossible for microorganism to utilize the fluid called "bond water" which is strongly connected to food component.

(On the other hand, the water whose connection to food component is very weak is called "free water" = it activates microorganism.)

Based on the above drying moisture content, semi-dried is produced with raising moisture content by small percentage. This is called "intermediate moisture food" .

With remaining a certain amount of palatable texture, the level of water activity is decreased to the level which suppresses the microorganism activity causing food poisoning, which keeps preservative quality.

SUMMARY OF THE FEATURES

- 1) Farm and marine products which are usually disposed of are utilized as foods.
- 2) Raw or blanching products such as vegetables, fruits and marine products are drying processable.
- 3) Low temperature decompression process makes it possible to preserve the nutritional value, color and scent with no damage.
- 4) Moisture content is adjustable from dry to semi-dry condition.
- 5) It is possible to be stored for long periods by keeping water activity level 0.5 or less.
- 6) Miniaturization of drying facility is equipped to deal with small lot request. (100kg of raw foods becomes 5~20kg approx.).
- 7) Drying by commissioning is main, however we also provide a set of process from purveyance to drying if necessary. Moreover, acceptable from cropping
- 8) [No additives in the drying process](#)

SUMMARY OF THE PROBLEMS

1) [As a result of careful thinking in line with reflecting nature without seeking efficiency and quantity, this drying process needs a little time.](#)

[\(Decompression permits the saving of some time, however this process takes 16~24 hours for draining a food of some of its juice.\)](#)

- 2) You may have sensation of relatively expensive due to long-term process and small lot.
- 3) Foods whose smells linger in are unacceptable. (Garlic, Japanese pepper and so on).
- 4) [Foods having high oil content \(some kinds of meats and fishes\) are unacceptable due to facility reason.](#)

You can try out our drying process

Please prepare approximately 10kg of foods for a trial. It costs 10,000~20,000 JPY depending on process.

Process date including moisture content will be attached.