THE SCIENCE WORLD
A Monthly e Magazine
ISSN:2583-2212
Popular Article
September 2024 Vol.4(9), 3763−3767

Sous Vide: A Novel Culinary Technique to Cook a Healthy Food

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https://doi.org/10.5281/zenodo.13911850

Abstract

Sous vide is a new cooking technique and nowadays getting popularised among new generation. In the early 1970s, revolution came when this technique started to apply producing foie gras with minimum loss. In this process, food is mixed with proper ingredients and then tightly wrapped in plastic packets prior to cook in water bath at predetermined temperature. The sous vide food can be consumed directly or can be lightly grilled, or broiled the food to add a crispy, golden exterior layer according to consumer taste. Here, cooking can be done by achieving the perfect taste and texture at desirable 'core' temperature and preserving maximum of its integrity, flavour and colour. No other cooking method but sous vide cooking can provide the most desirable product to the consumer. So, this method can be considered as a perfect cooking method and the truth is that meat, fish, vegetables or any other food taste like never before.

Key words: Sous Vide, Cooking, Doneness, Quality, Food.

1. Introduction

Food is the substance generally consumed to get energy. It is consisting of essential component like protein, fat and carbohydrates with some supplementary substances (vitamins and minerals) and helps in growth and make our body strong enough to fight against diseases. Ancient Greek Physician Hippocrates, the Father of Western Medicine, advocated "Let food be thy Medicine" and promoted that "Our food should be our medicine and our medicine should be our food". So safe and suitable food is necessary for healthy living. Protein is considered one on the vital nutrients need for our body function properly. Fish and meat are good source of easily digestible protein with proportionate number of amino acids essential for biological activities, healthy fatty acids and other necessary nutrient like vitamins and minerals. Fish and meat products are generally cooked before consumption.

Cooking i.e. heat treatment makes the food more digestible, palatable and acceptable by enhancing the sensory and nutritional quality. Cooking is also necessary to destroy spoilage as well as foodborne microorganisms for achieving food safety. Generally, the consumers prefer for goodness of food in terms of tenderness, appearance, flavour and nutrition. Cooking methods are having important effects on all these properties. There are various cooking methods (heat treatments) like frying, roasting, grilling, boiling, steaming are being followed to prepared foods. However, some heat treatments can cause undesirable nutritional loss in food as well as loss of appearance like overcook, uneven heating, moisture loss, shrinkage and hard texture etc. The processor as well as consumers are always in search of a proper cooking methods where food will be in its maximum nutritional value and perfect doneness. Sous vide can be the option for this. In French, 'Sous vide' means "under vacuum". During sous vide processing food is being vacuum sealed in a heat-stable, food-grade plastic pouch and boiled at precisely controlled temperature in the water bath. In comparison to other cooking methods, this method is an interesting cooking alternative as food holds its prefect level of doneness with natural sensory qualities and nutritional value.

2. Methods of Cooking

Cooking i.e. heat treatment makes the food more digestible, palatable and acceptable by enhancing the sensory and nutritional quality. It also helps to destroy spoilage as well as foodborne microorganisms for achieving food safety. Heat is important to enhance taste and flavour as well as prolong shelf life of food. Generally, high quality foods in respect to tenderness, appearance, flavour and nutrition are demanded by in terms of and, the cooking methods are having important effects on all these properties. There are various cooking methods (heat treatments) like frying, roasting, grilling, boiling, steaming are being followed to prepared foods. However, some heat treatments can cause undesirable nutritional loss in food.

Depending upon the mode of heat transfer, two types of cooking methods are practiced in food preparation: one is Dry-heat cooking and another one is Wet-heat cooking

2.1. Dry-heat cooking

In this process, no liquid medium, not even oil, is used for heat transfer. Generally hot air, microwave frequency or radiation may be used to cook the food. Barbecuing, Microwave cooking, Grilling etc. are examples of dry-heat cooking method. In Grilling method food is being roasted on a rack or revolving spit over the heat source like gas flame or hot charcoal. Barbecuing is more or less same as grilling, but done at low temperature than grilling. Barbecuing takes more times to cook the food. Microwave cooking is the method where electromagnetic energy is converted into thermal energy within the food materials and cook it by converting electromagnetic energy into thermal energy within the food material.

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Published 30/9/2024

Figure 1: Dry cooking

Figure 2: Wet Cooking (Steaming)

2.2. Wet-heat cooking

Wet heat cooking is the process where heat is transferred through any liquid medium specially water in the form of boiling water or steam and sometimes oils are used to transfer the heat to the food materials. Boiling, Steaming and Deep frying are the common methods of wet cooking.

3. Demerits of traditional Cooking

Generally, in traditional cooking methods extreme heat treatment (more than 100^0C) is applied for food preparation which sometimes causes various undesirable changes in products such as, loss of appearance, loss of heat labile nutrients, loss of minerals and vitamins, discoloration, alteration of texture, over cooking etc. In this context, sous vide can be the most suitable method of cooking in respect to the nutritional quality and doneness.

4. Why Sous vide cooking is superior over other traditional cooking?

- Reduces concentration of oxygen.
- Preserves sensory quality (volatile compounds).
- Improves shelf-life.
- Enhances taste and texture.
- Preserves nutrition.
- Reduces water loss

5. History of Sous Vide

In 1799, Benjamin Thompson first described the sous vide technique. In his experiment, he cooked foods through dry heat method using air for heat-transfer. But the modern sous vide technique started when French chef Pierre Troisgros cooked a quality Foie Gras in boiled water in the early 1970s. and Chefs began to acquire sous vide circulators widely for their kitchens in the early 2000s.

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6. Sous vide cooking

The processor as well as consumers are always in search of a perfect cooking methods where food will be in its maximum nutritional value and perfect doneness. Sous vide is comparatively new cooking form and getting popularised among new generation. Sous also known as low temperature long time (LTLT) cooking. Sous vide can be the option for this. 'Sous vide' is a French term which means "under vacuum". Sous vide is a processing technology to cook food at gentle temperature (at 65 to 95°C, but not >100°C for longer times followed by rapid cooling (up to 0–4°C), precisely in controlled water bath, putting them in heat-stable, food-grade vacuum sealed plastic pouch. Compared to other cooking methods, this method is an interesting cooking alternative as food holds its prefect level of doneness with natural sensory qualities and nutritional value. The new form of cooking like Sous vide, began in the early 1970s, is getting popularised among modern generation to reduce the product loss of foie gras. In this process, food is mixed with proper ingredients and then tightly wrapped in plastic packets prior to cook in water bath at predetermined temperature. The sous vide food can be consumed directly or can be lightly grilled, or broiled to develop taste more appealing to consumers. Here, cooking can be done achieving perfect 'core' temperature for desired taste and texture and, preserving maximum of its integrity, flavour and colour. Results from this style of cooking are incomparable to those from any other manner of cooking. So, sous vide can be considered as a perfect cooking method and the truth is that meat, fish, vegetables or any other food taste like never before.

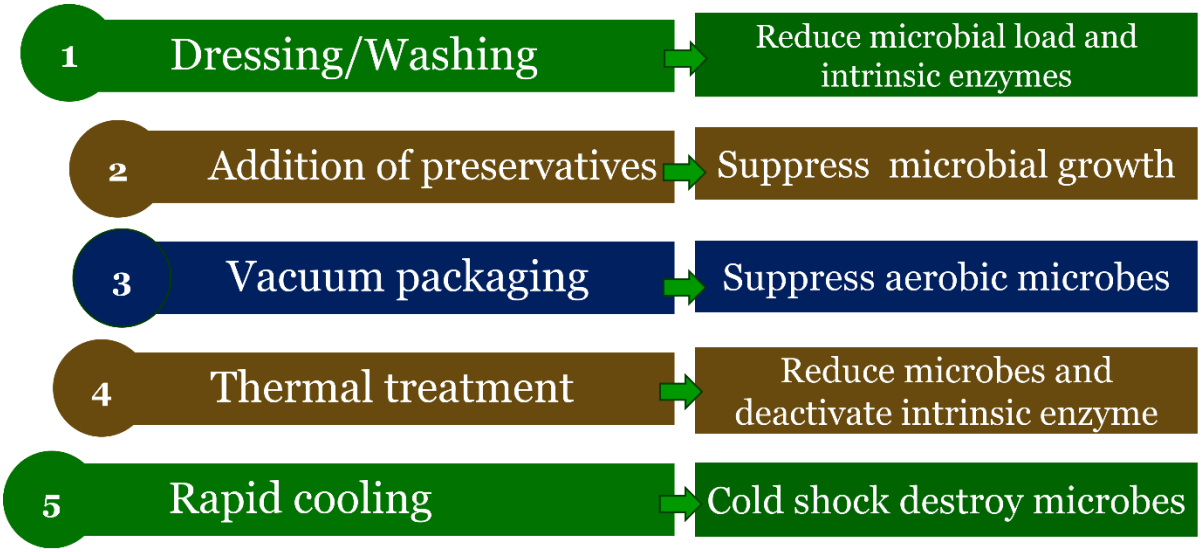

Figure-1: Steps involved in sous vide cooking and their effects on food quality

7. Advantages of Sous vide cooking

1. There is a great possibility to control over the cooking process and achieve a quality finished product.
2. It provides a food with optimum doneness and tenderness.

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3. It produces high yield products as it reduces product waste
4. It reduces nutritional loss by protecting the essential nutrients from destruction.
5. It creates dramatic cost reduction for labour and processing.
6. As the food is vacuum packed, food can be preserved for long time and can be transported to long distance.
7. There is a very low chance of cross contamination.
8. This technique lowers the ingredient cost by intensifying the natural flavour of the food.

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