THE MEAT LOCKER

BY AMERICAN MEAT SCIENCE ASSOCIATION

Introduction to Sous-vide Cooking for Processors

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Sous vide is a technique that cooks food inside sealed pouches using a temperature-controlled water bath for a defined period of time. Originally developed for use in fine dining establishments, it has seen a recent surge in interest both by consumers and the industry. In this introduction, we'll cover a brief history of the technique, address some of the reasons to consider using it, how processors can ensure safety concerns are addressed, and offer some practical tips and ideas to help processors get started. Information for consumers will be coming in future publications.

History

The technique known as sous-vide (French for "under vacuum") is credited to Georges Pralus a French chef, who developed it in the mid 1970's to reduce cook loss and improve quality of foie gras. That said, the idea of sealing a food in an impermeable (often flexible) container, and cooking via submersion in a hot liquid appeared in multiple cultures throughout history. And while the modern technique was originally focused on fine dining, it has been adapted to commercial and institutional markets as well.

Key Elements of the Process

- **Packaging**
  Vacuum packaging is essential, as the product needs to make good contact with the body of the package to ensure good heat transfer. Air pockets, and large voids can act as insulators, thus most applications use flexible pouches which have been evacuated of air.
- **Cooking**
  The product relies on heat transfer by conduction, and in that regard, water is superior to air. Circulation is also key, as it increases the rate at which heat is transferred.
- **Precision**
  Careful control of the water temperature ensures the product doesn't overcook.

While technically sous-vide can utilize any temperature, most applications rely on long cooks at temperatures close to the desired level of doneness.

Reasons for adopting a sous-vide process

Uniform Targeted level of doneness: A properly validated sous-vide process can safely create levels of doneness in meat products other than "well done", with little to no gradation along the thickness of the product.

Reduced cook loss: By cooking the products in a sealed pouch evaporative losses cannot occur, and the typical lower temperatures can result in less purge compared to higher heat processes.

Increased tenderness: The lower cooking temperatures typical to the technique are thought to result in less severe contraction of muscle fibers, improving texture. At the same time, the prolonged cook time at those lower temperatures can allow, or in some cases even intensify the activities of tenderizing enzymes, whether native to the product or added during processing.

Elimination of post-process contamination: When sous-vide is used as the primary thermal treatment, the product is sealed in an impermeable package, which prevents the transfer of environmental microbes responsible for spoilage and/or illness.

Convenience and Novelty for the consumer: Sous-vide is a technique many consumers are curious about, but they may be unwilling to devote the time or resources to performing it themselves. Products subjected to the process in the plant could help fulfil that curiosity with limited effort on their part- simply reheating or searing the prepared product would be all that is required.

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Details and Considerations

Packaging

- Choose package materials than can hold up to immersion cooking without rupturing. In particular, be careful when using shrink bags, especially with higher temperature processes, as the prolonged heat can sometime lead to additional contraction and possible package failure.
- Outside of products for food service, secondary packaging will be beneficial, both for ease of distribution/ display and as a means of improving appearance.

Products

- Consider consumer demand/ interest—what level of doneness would they prefer? Is there a cut of meat or type of product that this process could increase the convenience for customers?
- Decide whether your product will require additional cooking by the consumer/client, or simply warming.
- The product will likely need a higher price point (compared with traditionally processed products) to offset the increased time and equipment needed—determine whether this is a product that consumers/clients would be willing to accept at that premium price?
- Don't discount the possibility of pre-seasoned "sous-vide ready" products—just make sure the pouch provided can withstand the consumer/client's process.

Process

- The extended time needed to perform sous-vide is probably the largest limiting factor for a commercial operation. As such choice of equipment that can maximize batch size/throughput is critical.
- With recent increased interest, equipment manufacturers have been developing specialized sous-vide systems for processing plants.
- Always work with a validated process based on the geometry and composition of your product, as well as the specific parameters of your processing equipment.
- If choosing a co-packer, make sure they can meet all of your needs, and understand the process.
- If creating a product that is "Ready to Warm," account for any surface treatments that will be needed (e.g searing and grill marks)

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