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Guide to clean label production: 5 steps for more natural food products

Consumers expect their food to be healthy and safe. Increasingly they prioritize foods made using future-friendly manufacturing methods and with fewer additives. But how to go 'clean label'? Here's a producers' guide to help you embrace the clean label trend.



Fewer unhealthy things (like salt, sugar and fat) and more good things (like all-natural ingredients, healthy protein and plant-based content). That's what many modern consumers want their food to contain.

But concerns about food safety, shelf life, and product taste, appearance and texture make formulating clean label products anything but easy.

So, here are five tips to help you produce clean label products with a perceived healthier, more natural profile.

1. Do your homework first

Are you aiming to produce a product that fits into an existing clean label, or to make your product more natural? Perhaps you are looking to create a new clean label or natural segment?

In each case, it is vital to do your homework and to define your target well. A natural starting point is to gather market evidence and answer the following questions:

Is the clean label or natural trend relevant in your market?

- What does clean label mean to your target consumer?
- Which additives are acceptable to use in a clean label product in your market?
- Which additives may you have to remove?
- What are the alternatives and how does the market perceive them?
- How might you need to change the current recipe?
- Is it necessary to improve your production process and line design?

2. Stress test your planned product

Removing preservatives or changing pH, salt and sugar content may require changes in the production and filling processes to ensure a safe shelf-stable product. The entire production process, from raw material to packed product, must be thoroughly reviewed.

It is crucial to stress-test any new clean label recipe and its shelf life stability. Doing so will give you clues as to what type of microorganisms can grow or survive in the new recipe and process.

Once you have completed your stress tests, you are ready to design the right process for the journey from raw material to packaged product – and to ensure a product that is shelf-stable and has the desired taste and appearance.

3. Optimize your ingredient handling and embrace cold storage

Ingredient and raw material quality are paramount. All ingredients must meet high microbial standards to conform with food safety and shelf stability requirements.

In mayonnaise, for example, the egg must be pasteurised and stored in cold conditions to ensure safe handling. In dressings, the premix preparation phase should be free from pathogens and microorganisms able to grow in the final product to assure food safety and minimize spoilage, and to avoid the need for preservatives to extend microbiological stability.

Clean label may also involve choosing a healthier oil – but one that can withstand your process and deliver adequate shelf life without changing taste.

Here, oil storage can be vital. Storing oil cold, ideally below 10°C, prolongs its storage time. Cold storage can be facilitated by adding nitrogen to the storage tank. Indeed, nitrogen treatment can be added throughout the production process – from mixing to filling – to prevent air from entering the product.

The effect can be further improved by deaerating the oil before storage. Deaeration – the removal of air – reduces the oil's sensitivity to oxidation. Adding more natural antioxidants that protect the oil from oxidizing also offer a route to a cleaner label.

4. Never lose sight of hygiene

Fat and water content are key parameters. The more water a product contains, the more vulnerable it is to microbial spoilage. Spices also pose a microbiological risk. When producing a product without preservatives that contains spices and/or elevated water content, you need to calibrate your process to ensure good hygiene.

For low-viscosity premixes of warm swelling starch that will be used for low-fat mayonnaises and dressings, a plate heat exchanger optimized for heat-sensitive products ensures cost-effective heat treatment. A plate heat exchanger can, to some extent, also handle mixes containing fibres or particles several millimeters in size and with viscosities of up to 800 cP.

When the premix contains larger particles or has viscosities that exceed 800 cP, tubular heat exchangers or scraped surface heat exchangers are recommended. Both tubular and scraped surface heat exchangers offer minimal shear, which safeguards fragile starch solutions. With a continuous process of heating and cooling the starch can be optimally treated in terms of time and temperature ensuring the food safety and optimized energy usage.

In low-fat dressings, water, starch, spice and acids are mixed in the premix stage and pasteurized to inactivate any vegetative microorganisms present. A heat-treated premix without preservatives is sensitive to recontamination. If yeast or moulds enter the product after heat treatment, they can shorten its shelf life.

Thus, high hygienic design in all processing steps downstream from the premix pasteurization is essential to ensure consistent product quality and avoid the need for additives to extend microbiological stability.

5. Review your filling, storage and distribution processes

When filling, for example, a dressing, your packaging machine and packaging material need to preserve product quality. Cold fill and chilled distribution give benefits in terms of shelf life, by delaying oxidation. But with the right process design and control of downstream equipment, you get dressings and sauces for safe ambient distribution and storage.

This will minimize or eliminate the need for preservatives and additives that enhance stability and texture. Generally speaking, the more accurate and controlled you are in processing your products, the fewer additives you need to add and the more natural your product can be.



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What is clean label?

Clean label refers to the ingredients and processing background of a food product as shown on its label. Consumers view products with fewer ingredients as healthier than those with more.

A label may be seen as clean if it is free from additives (e.g. E-numbers) and preservatives and incorporates natural-related claims such as organic and non-GMO.

In developed markets it is becoming increasingly important to include other information, such as ethical and climate-friendly claims. Hence, next-generation clean label products will need to look beyond the ingredient statement and align their processing, packaging and ingredient sourcing with a clean label position.



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