

Perfecting plant-based foods with Kemin solutions

No veggie left behind

With the rise of environmental awareness and vegetarian as well as flexitarian lifestyles, plant-based food products and meat analogues are entitled to their own, unique positions in the international food market.

THE RISE – AND PITFALLS - OF PLANT-BASED FOODS

More and more conscious consumers turn to a plant-based diet, in the form of more vegetables, as well as meat analogues: food made to resemble meat in terms of flavour, texture and appearance yet with no animal products whatsoever. Environmental awareness and animal welfare concerns are often additional drivers behind the growing demand for quality plant-based food.

It's safe to say meat alternative products are here to stay, fresh and full of flavour. Modern consumer demands have undergone changes. Label-friendly ingredients are a perfect fit to offer consumer-friendly and transparent solutions for this growing food category. Alongside of this, plant-based food products need the same protection against oxidative rancidity and microbial spoilage.

For these reasons and more, Kemin assists manufacturers of plant-based food products in ensuring their products stay fresh, safe and appealing. Plant-based meat analogues are susceptible to various conditions, posing some big challenges. Oxidation is a clear threat and an obvious accelerator of known carbonyl compounds like aldehydes and ketones causing rancidity in flavour and smell. Microbial spoilage acts as a likely source of lactic acid bacteria and potential outgrowth of listeria monocytogenes. Finally, water soluble pigments obtained from beets – a common ingredient in plant-based foods – like betanin are prone to colour loss.

HOW DOES KEMIN COMBAT THESE CHALLENGES?

Kemin provides a complete line of label-friendly solutions committed to protecting our customers' plant-based products, as well as guaranteeing top performance in terms of shelf life stability, food safety and colour protection.

Our solutions include:

- **BactoCEASE® NV Dry** – buffered vinegar solution to protect against microbial spoilage
- **NaturFORT™ 12 Dry** – rosemary and green tea combination to preserve flavour, colour and odour

Figure 1: Microbial stability. Average Total Plate Counts (Log₁₀ CFU/g) of “vegan beef burger” treatments during refrigerated storage.

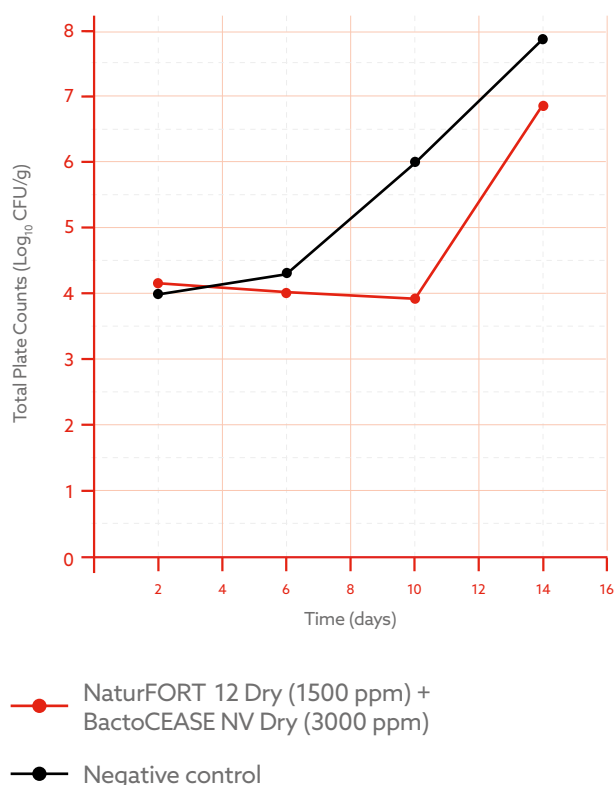
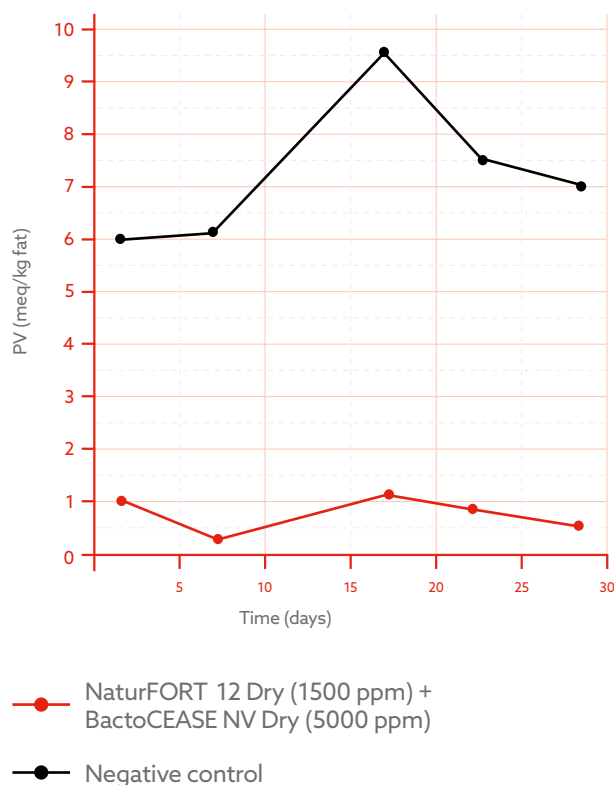


Figure 2: Lipid Oxidation. Average peroxide values of “vegan beef burger” treatments during refrigerated storage.



Dosages calculated on final product weight

CASE STUDY

How to protect vegan beef patties from oxidative rancidity and microbial spoilage using a combination of BactoCEASE NV Dry and NaturFORT 12 Dry solutions?

Storage: Modified Atmosphere Packaging (MAP; 70% N₂ 30% CO₂) in refrigerated conditions at 4°C under illumination for 12 hours a day

MICROBIAL GROWTH

Microbial growth occurs during refrigerated conditions. BactoCEASE NV Dry buffered vinegar solution effectively slowed down the microbial growth, while the rosemary and green tea combination NaturFORT NV 12 Dry showed consistently lower concentrations of primary and secondary products during the storage study.

The combination of NaturFORT 12 Dry and BactoCEASE NV Dry is the **optimal solution for vegan beef patties to preserve flavour and taste, as well to increase the microbial stability.**



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