# Clean label alternatives to the use of nitrite in cooked ham – results of a pilot study

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## Introduction

Environmental and health concerns over the use and consumption of artificial additives like nitrite have prompted consumer wishes and desire for "cleaner" products containing natural ingredients whose names they know and understand[1,2]

## Objectives

The aim of this work was to assess if natural sources of nitrate in combination with nitrate-reducing starter cultures would be good substitutes of chemical nitrite in cooked ham

## Methodology

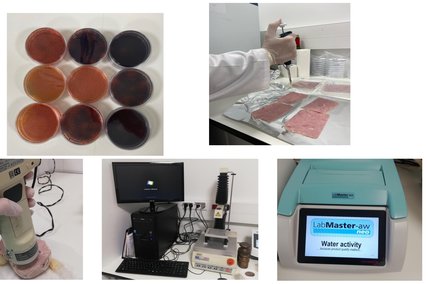

Four cooked hams, combining rich nitrate vegetable sources with two different nitrate-reducing commercial starter cultures were manufactured at pilot scale by *Primor*

**Microbiological analysis**

- Total Counts
- Lactic acid bacteria
- *Enterobacteriaceae*
- *Listeria* spp.
- *Clostridium* spp.
- Challenge test – *Listeria* monocytogenes

**Physicochemical analysis**

- Colorimetry
- Texture Profile Analysis
- pH and water activity




## Results and discussion

- With the exception of Enterobacteriaceae, which were not found in the control ham, all other microbiological parameters were similar for the various hams
- The challenge test showed that at abuse temperature, *L. monocytogenes* increased 1 to 2 log cycles when compared to storage at 4 ℃
- The colour, texture, pH and $a_w$ values were similar for the four test hams and the control throughout storage (28 days)

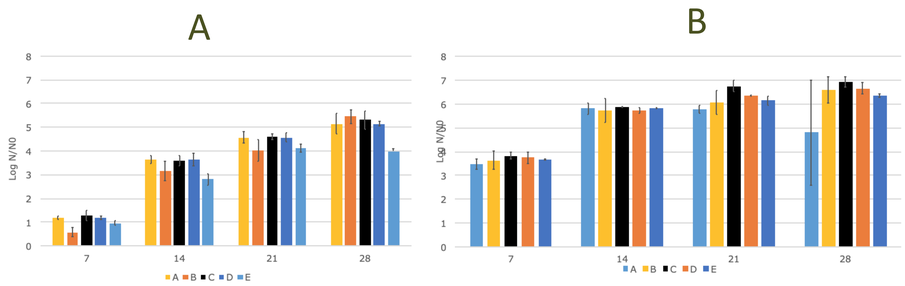



**Figure 1.** Challenge test with a *L. monocytogenes* cocktail at 4 ºC (A) and 10 ℃ (B)

## Conclusions

These preliminary results demonstrate the potential of using natural sources of nitrates combined with nitrated-reducing starters as a clean label alternative to the use of nitrite in cooked ham, maintaining microbiological safety and organoleptic properties

## Acknowledgements

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