

# NITRATES AND NITRITES IN MEAT PRODUCTS. ALTERNATIVES IN ITS PROCESSING AND LABEL

**BRUNO MONTEFUSCO DEL PINO · FINAL DEGREE PROJECT · JUNE 2021**

## BACKGROUND

FOR YEARS THERE HAS BEEN A TREND ON PART OF THE CONSUMERS THAT RELATES THE PRESENCE OF ADDITIVES (E NUMBERS) WITH NEGATIVE EFFECTS ON HEALTH. THAT MADE THE FOOD INDUSTRY WANT MORE CLEAN LABELS AND WITHOUT ADDITIVES. NITRITES IN MEAT HAVE 2 MAIN FUNCTIONS:

- FIXATION OF THE CHARACTERISTIC COLOR OF THE MEAT
- ENSURING THAT WE HAVE A MICROBIOLOGICALLY SAFE PRODUCT

## OBJECTIVES

THE AIM OF THE PROJECT WAS TO REVIEW THE CURRENT SITUATION REGARDING STUDIES OF THE “NON-USE” OF NITRATES / NITRITES AND THE OPTIONS THAT HAVE BEEN RAISED SO FAR. AS WELL AS DISCUSSING THE ROLE OF THE FOOD INDUSTRY IN COMMUNICATING THIS DANGER TO THE CONSUMER.

## PLANT EXTRACTS



- THEY HAVE A GOOD CONVERSION OF NITRITES TO NITRATES
- MICROBIOLOGICALLY SAFE AGAINST *L. MONOCYTOGENES* AND *C. PERFRINGENS*
- LESS RESIDUAL NITRITES BECAUSE OF THE PRESENCE OF ANTIOXIDANTS
- RADISH AND CELERY ARE THE MOST STUDIED

## BACTERIOCINS

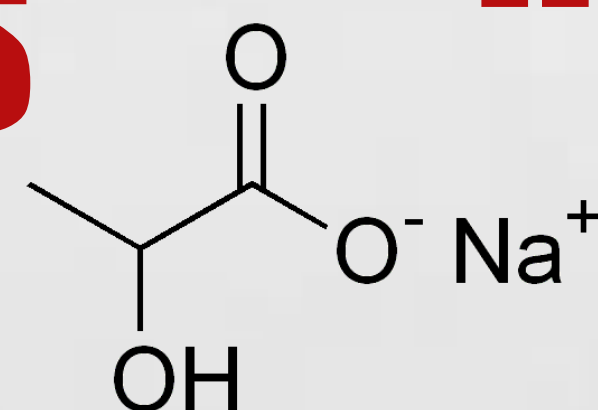


- NISIN, IS THE ONLY ONE CURRENTLY ALLOWED
- IT HAS ANTIMICROBIAL EFFECT IN SYNERGY WITH ESSENTIAL OILS
- PEDIOCIN IS NOT ALLOWED BUT THERE ARE ALREADY STUDIES OF ITS EFFECT AGAINST PATHOGENIC MICROORGANISMS LIKE *L. MONOCYTOGENES* IN READY TO EAT (RTE) PRODUCTS

## DISCUSSION

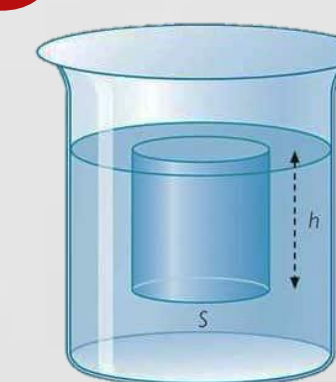
- THERE IS CURRENTLY NO ALTERNATIVE THAT DOES THE FUNCTION OF NITRITES
- EFSA ESTABLISHED LIMITS IN THE NITRITES APPLICATION TO GUARANTEE THAT THEY ARE SAFE. NOWADAYS THERE IS A LOW RISK AND A HIGH DANGER PERCEPTION
- THIS IS TRADUCED IN A LACK OF EDUCATION AND INFORMATION TO THE CONSUMER

## ORGANIC ACIDS



- ACID LACTATE IS ONE OF THE MOST USED
- 2-3% SODIUM LACTATE ENSURES THE INHIBITION OF *C. BOTULINUM* AND ITS TOXINS
- IN BEEF, NADH AIDS IN THE FORMATION OF NITROSO-HEMOGLOBIN, WHICH GIVES COLOR STABILITY AND AN INCREASE OF THE CURING SPEED
- POTASSIUM SORBATE + LOW NITRITES SHOWED ALSO GOOD RESULTS

## HIGH HYDROSTATIC PRESSURE



- CONSISTS ON THE APPLICATION OF PRESSURE TO IMPROVE MICROBIAL SAFETY OF FOOD
- 350 MPA 6 MIN AT 20 °C. PROVED SYSTEM THAT GUARANTEES A MICROBIOLOGICALLY SAFE PORK, WITHOUT NITRITES
- IF WE APPLY + 400 MPA WE GET UNWANTED CHANGES IN THE STRUCTURE OF THE MEAT
- LOWER PRESSURE IN COMBINATION WITH OTHER OBSTACLES IT IS PROVED TO BE A GOOD ALTERNATIVE

## CONCLUSION

- NONE CAN SIMULTANEOUSLY PROVIDE ALL THE FUNCTIONS OF SYNTHETICALLY ADDED NITRITE AND WHERE MORE NEEDS TO BE INVESTIGATED IS IN PREVENTING SENSORY PROPERTIES FROM BEING AFFECTED
- THE MOST VIABLE OPTION TO DATE IS THE USE DIFFERENT OBSTACLE TECHNOLOGIES, THAT ALLOW TO REDUCE THE CONCENTRATION OF NITRITES AND PERFORM A SIMILAR FUNCTION.
- WE NEED ADMINISTRATION AND SCIENTIFIC COMMUNITY TO EDUCATE PEOPLE SO THEY KNOW NITRITES, IN THE DOSES USED, ARE SAFE