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The microbiological safety challenges of the spices and ingredients industry

COLIN Group

- Specialist in spices and culinary bases for the food-processing industry
- 50-year-old company
- 300 employees
- 2 processing plants in France
- 15000 tons/year
- Exports in 50 countries

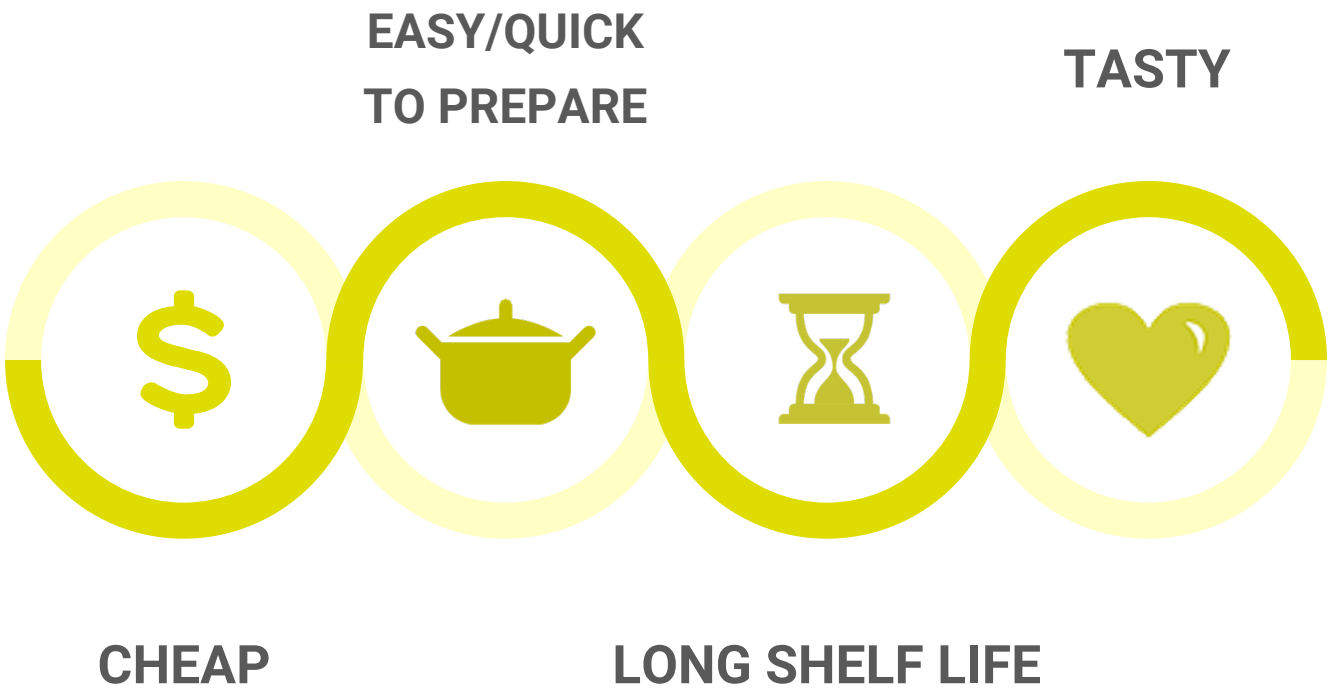
COLORING AGENTS AND FLAVOURS

VEGETABLE RAW MATERIALS

FUNCTIONAL INGREDIENTS AND BLENDS

Evolution of market and consumer requirements

Historical consumer expectations regarding food industry productions



Today consumer expectations regarding food industry productions

EASY/QUICK TO PREPARE

TASTY

NATURAL WITH NO ADDITIVES

CHEAPER

LONGER SHELF LIFE

ORIGIN

MAXIMAL FOOD SAFETY

Translation into microbiological requirements

Historically:

- *Salmonella*
- *Listeria*
- *Clostridium botulinum for special applications*

Translation into microbiological requirements

Since several years microbiological specifications became more stringent:

- Sporulated bacteria: *Bacillus cereus, Clostridlum perfringens*
- *Pathogenic E.coli*
- Viruses
- Minimal count on spoilage flora: *yeasts and molds, LAB….*

Example: common requirements from the cheese industry :

TPC < 5000 /g

Yeasts and moulds <10/g

Entero <10/g

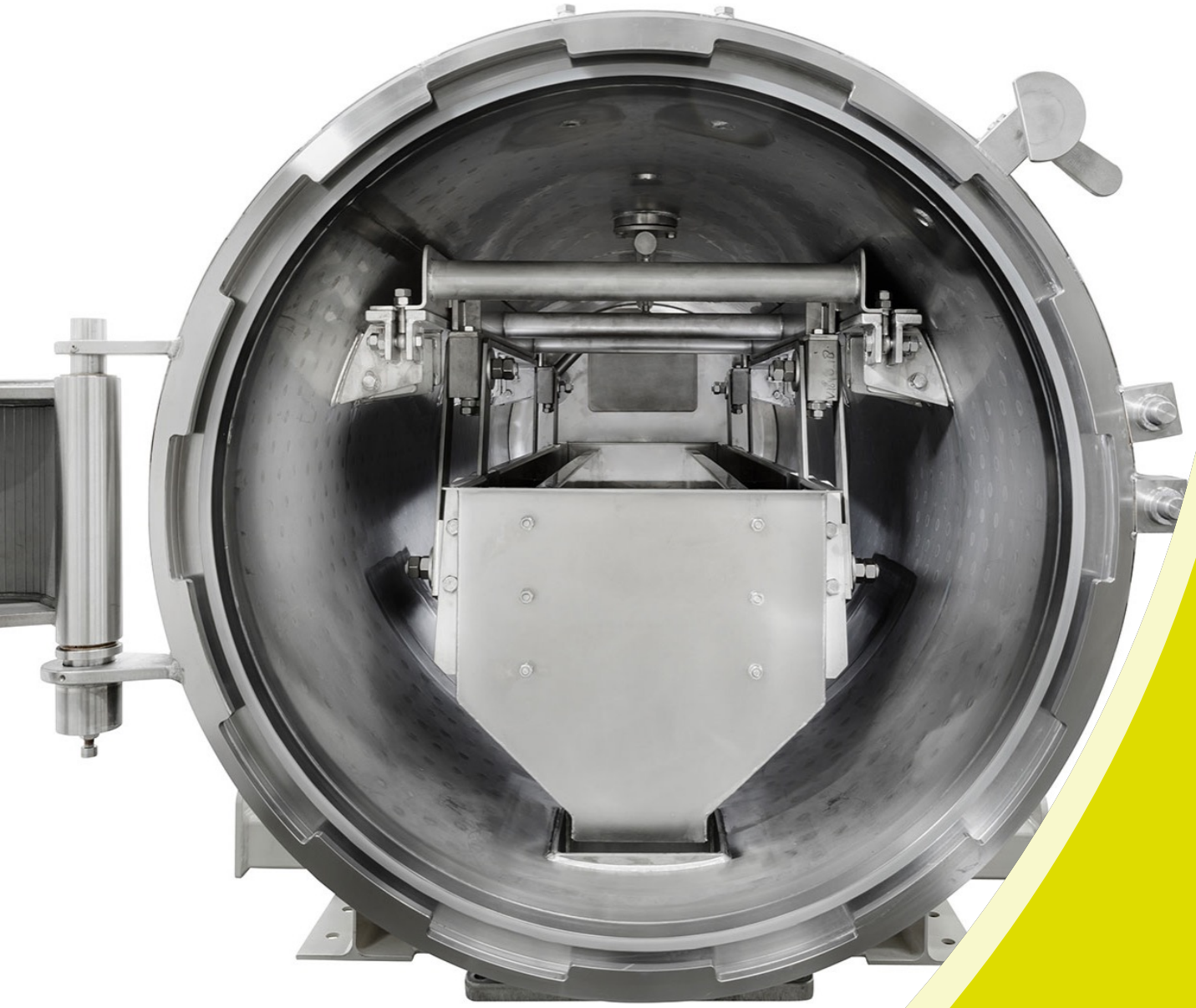
Bacillus and sulfito reducing bacteria <10/g

Spices and herbs risk assessment

Soaking pepper berries for processing white pepper

Spices and herbs risk assessment

- Wild products, ancestral processing, sun drying + direct floor contact, and irrigation result in high contamination levels
- Typically:
  - TPC and enterobacteria: several millions /g
  - *Bacillus cereus:* 10 to 100,000 /g
  - Sometimes high count of sporulated bacteria
  - Salmonella frequently present



Benchmark on technologies available to manage the risk

HEAT TREATMENT

Steam treatment, spirajoule, infrared…

ADVANTAGES	LIMITS
Frequently used on spices and herbs	Sensory effects (color, taste, smell)
Batch or continuous treatment	Chemical effects (essential oils)
Possible use of steam	Insufficient results on powders
Commonly qualified for 5-6 log Salmonella reduction	Limited reduction of heat resistant microflora
No regulatory issue	

FUMIGATION

Ethylene oxide, Propylene oxide…

ADVANTAGES	LIMITS
Alternative to heat treatment for some markets	Forbidden in Europe Residues

IRRADIATION

ADVANTAGES	LIMITS
Commonly used with very good results	Rejected by many customers since many years
on spices and herbs in the past	Bad knowledge from customers
Alternative to heat treatment for some markets	Restrictive regulations, labeling obligation
Few detrimental effects on product	

Conclusion

- Microbiological quality requirements ever more stringent
- New requirements on new microflora and lower count
- Decontamination is a requisite for many food sectors
- Decontamination methods currently available have limitations
- Ionisation could be a good compromise on herbs and spices
- Ionisation is penalized by its regulatory status and wrong consumers perception

THANK YOU