Seminario
I Laboratori Nazionali di Riferimento
Listeria monocytogenes e
Campylobacter

CONTROLLO DI *Listeria monocytogenes* IN PRODOTTI CARNEI MEDIANTE L'APPLICAZIONE DI HPP

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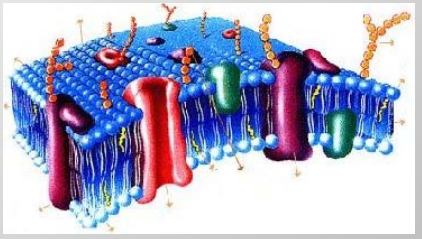
SSICA

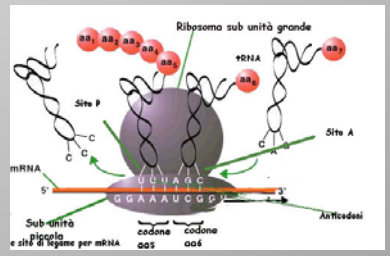
Teramo, 25/11/2014

EFFETTI DELLE HPP SUI MICRORGANISMI

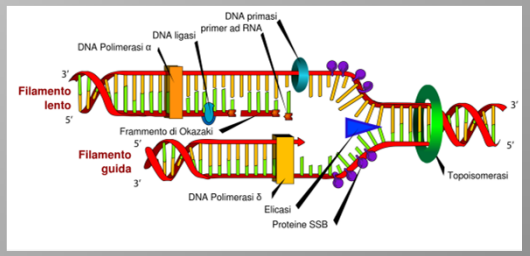
- Danni alle membrane cellulari

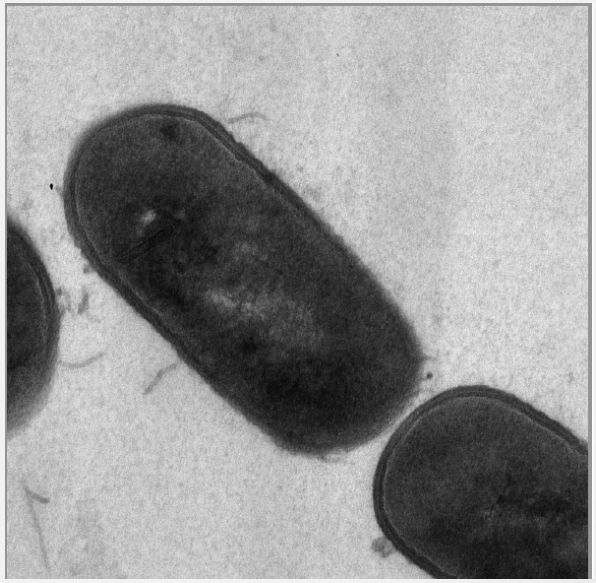


- Modifiche nella morfologia cellulare
- Inibizione della sintesi proteica



- Inibizione delle reazioni biochimiche
- Alterazioni genetiche





GRAM POSITIVI

600 Mpa/5’

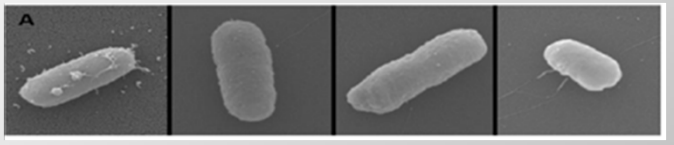
LISTERIA

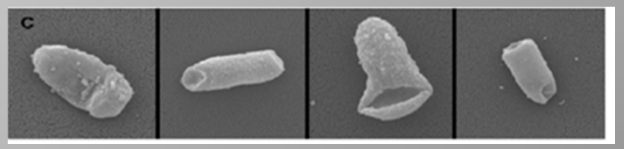
M. Hayman, tesi di dottorato, the Pennsylvania State University, 2007.

GRAM NEGATIVI

SALMONELLA /E. COLI

350 Mpa/25’

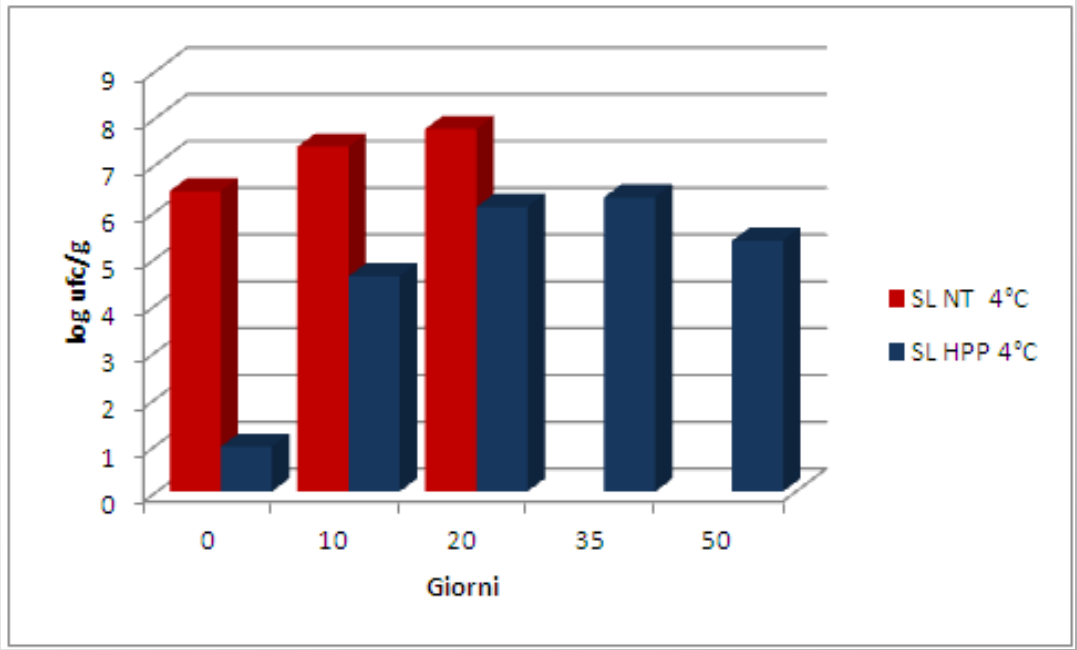




D. Ukuku *et al*. J. Food Process Technol, 2013, 4:6

DANNI SUBLETALI

SHELF-LIFE DI BACCALÀ AMMOLLATO TRATTATO A 600MPa/5’



Parametri chimico-fisici del baccalà ammollato
a_w=0,99
pH=6,5

FATTORI CHE INFLUENZANO LA SENSIBILITÀ DEI MICRORGANISMI NEI CONFRONTI DELLE HPP

- Parametri del trattamento
- Tipo di microrganismo

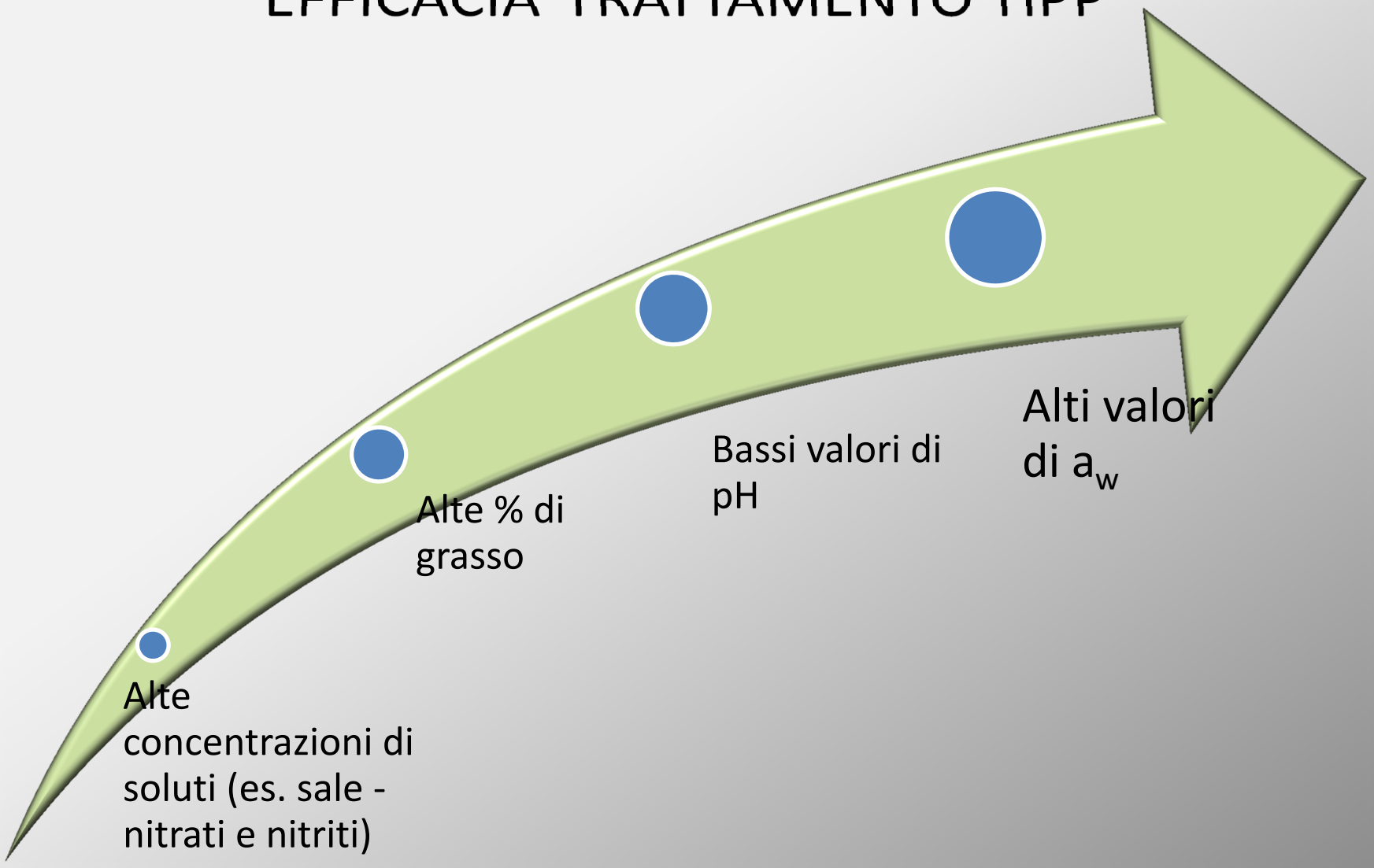
FORME VEGETATIVE > SPORE

GRAM NEGATIVI > GRAM POSITIVI

BASTONCINI > COCCHI

- Stato fisiologico dei microrganismi
- Composizione dell'alimento da sottoporre a HPP

EFFICACIA TRATTAMENTO HPP



APPLICAZIONE DELLE HPP PER IL CONTROLLO DI *LISTERIA* IN PRODOTTI CARNEI

Teramo, 25/11/2014

FSIS Compliance Guideline: Controlling *Listeria monocytogenes* in Post-lethality Exposed Ready-to-Eat Meat and Poultry Products

January 2014

This chapter provides technical information about control measures that are used to meet the requirements for the three alternatives and provides examples establishments can use to apply these control measures to their particular product.

2.1 Post-lethality Treatments (PLT)

According to the *Listeria* Rule, **post-lethality treatments (PLT)** are treatments that are designed to reduce or eliminate levels of *Lm* contamination on RTE products. Establishments may choose to use PLT to meet the requirements of Alt. 1 (use of a PLT and **antimicrobial agent** or **antimicrobial process** (AMAP) or Alt. 2a (use of a PLT alone). According to the *Listeria* Rule, establishments that use PLTs must include the treatment as a CCP in their HACCP plan and validate the effectiveness of the PLT.

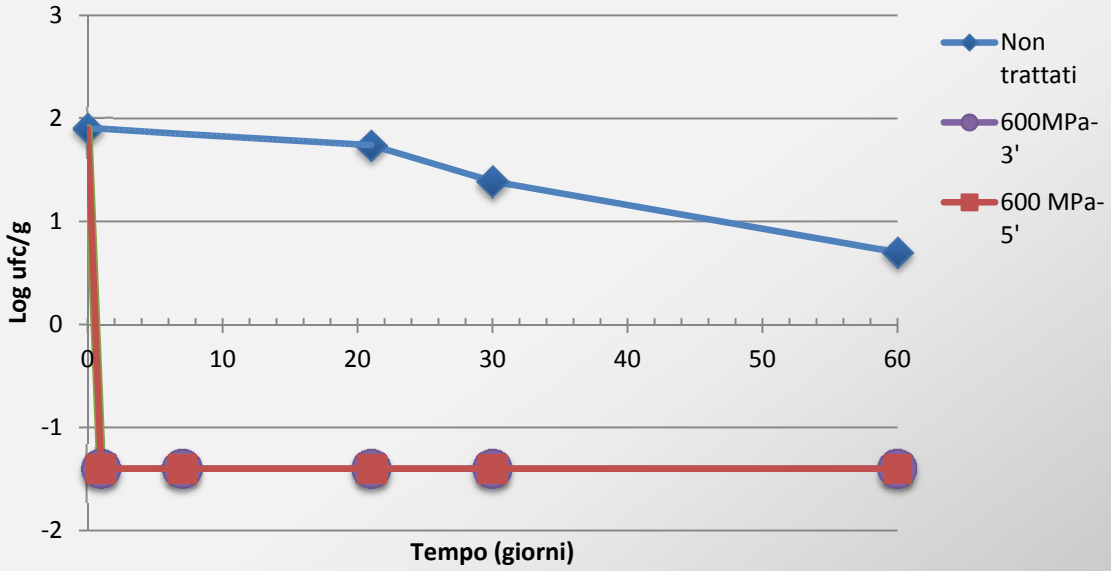
It is FSIS's expectation that PLTs will be designed to achieve at least a 1-log lethality of *Lm* before the product leaves the establishment. The PLT must be validated according to 9 CFR 417.4 and 430.4 as being effective in eliminating or reducing *Lm*. The establishment must also verify the effectiveness of the PLT and other control measures and make these results available upon request to FSIS personnel (9 CFR 430.4(c)(7)). Expected levels of control for PLTs and AMAPs are provided in Table 2.1.

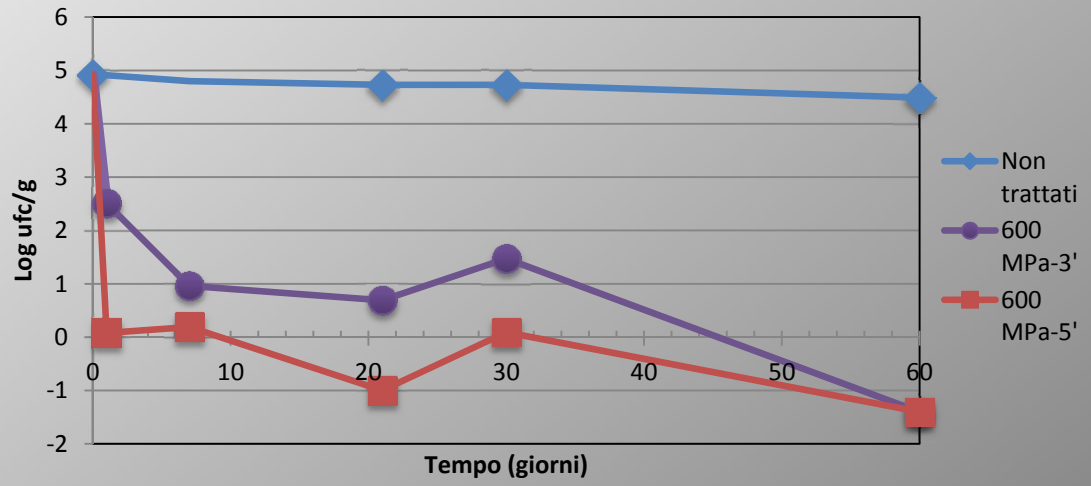
Examples of Post-lethality Treatments (PLT)

PLT for *Lm* may include:

- Steam pasteurization,
- Hot water pasteurization,
- Radiant heating,
- High pressure processing (HPP),
- Ultraviolet (UV) Treatment,[3]
- Infrared Treatment,
- Drying (Low water activity) (see example 1), and
- Other validated processes.

APPLICAZIONE DELLE HPP IN PROSCIUTTO CRUDO INOCULATO CON *LISTERIA MONOCYTOGENES*





Teramo, 25/11/2014

PRODOTTI CARNEI CRUDI A BREVE STAGIONATURA

September 2012

FSIS *Salmonella* Compliance Guidelines for Small and Very Small Meat and Poultry Establishments that Produce Ready-to-Eat (RTE) Products

5 RIDUZIONI DECIMALI PER *SALMONELLA* E 3 PER *LISTERIA*

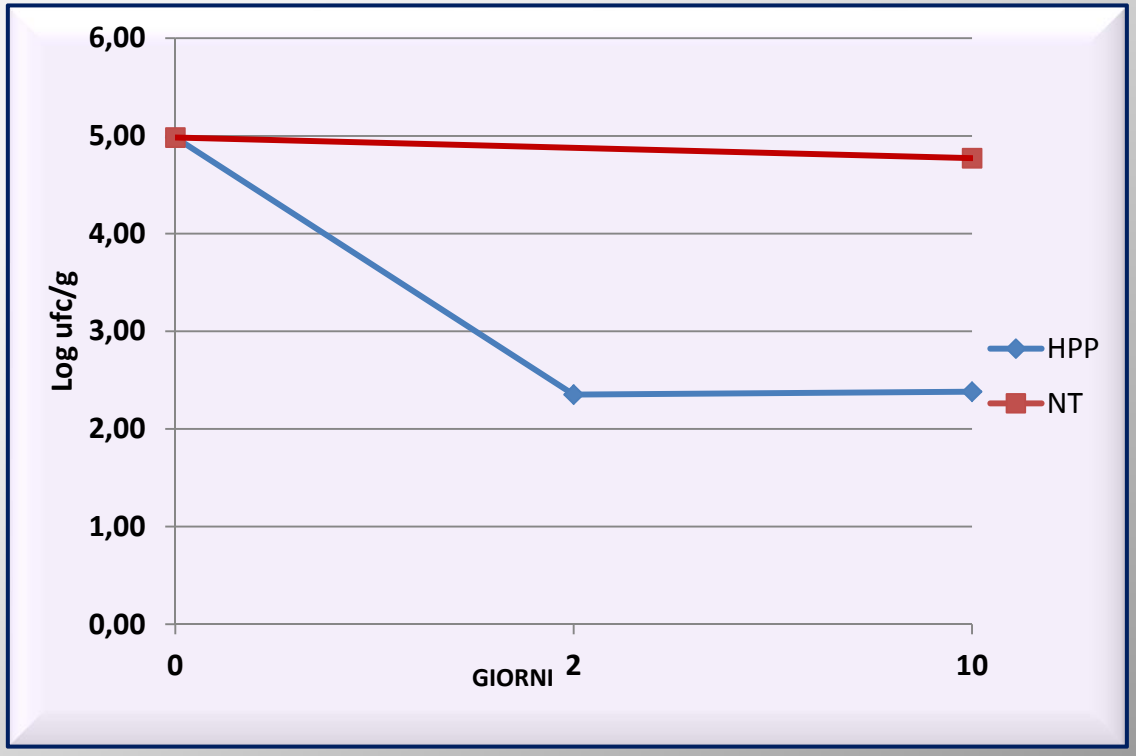
Option 4—Propose other approaches to ensure at least a 5-$\log_{10}$ reduction of *Salmonella*.

Processors can propose any combination of steps, the sum of which would result in at least a 5-$\log_{10}$ reduction of *Salmonella*. This requires precise documentation that the process achieved the 5-$\log_{10}$ reduction.

INSERIMENTO DI UN TRATTAMENTO/PROCESSO BATTERICIDA ALLA FINE DEL PROCESSO PRODUTTIVO

Teramo, 25/11/2014

INATTIVAZIONE DI LISTERIA INOCULATA IN SALAME MILANO TRATTATO A 600 MPa PER 5 MINUTI



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SALAME "GENOA"

- COMPOSIZIONE = 80% MAGRO, 20% GRASSO
- INGREDIENTI = 2,9% NaCl, 1% destrosio, 0,08% pepe bianco, 0,05% sodio ascorbato, 0,02% aglio, 0,015% nitrato, 0,005% nitrito.
- CONTAMINAZIONE = *L. monocytogenes*, *E. coli* O157:H7, *Salmonella* spp.

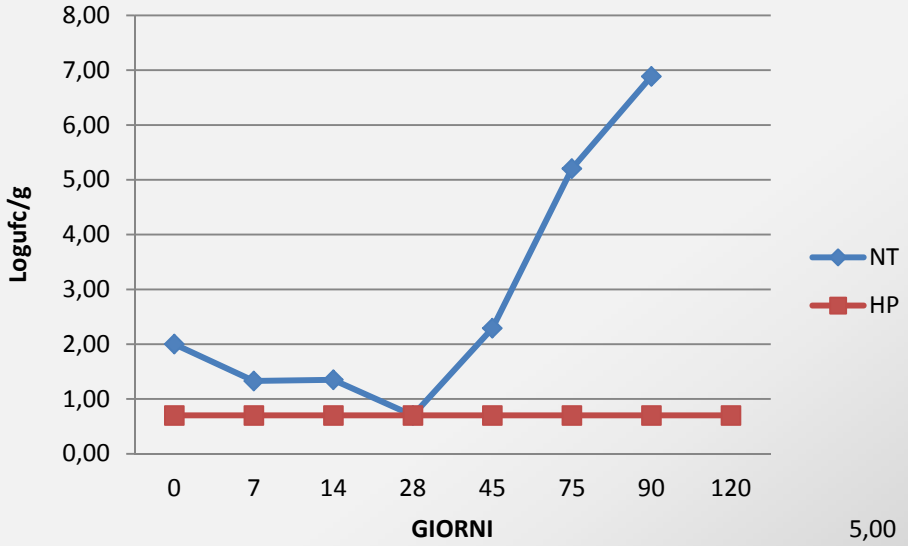
PATOGENO	IMPASTO	aw = 0,88		aw = 0,926		aw = 0,920		aw = 0,940	
		A	B	A	B	A	B	A	B
Listeria	7,14	5,84	3,46	6,08	2,14	6,02	< 1,0	6,07	1,53
Salmonella	6,95	2,5	< 0,3	2,21	< 0,3	2,18	< 0,3	2,74	< 0,3
E. coli	7,20	5,03	< 0,3	6,03	< 0,3	5,59	< 0,3	6,10	< 0,3

- Risultati espressi come log ufc/g, A = fine processo produttivo, B = dopo trattamento HPP 600 Mpa/5'

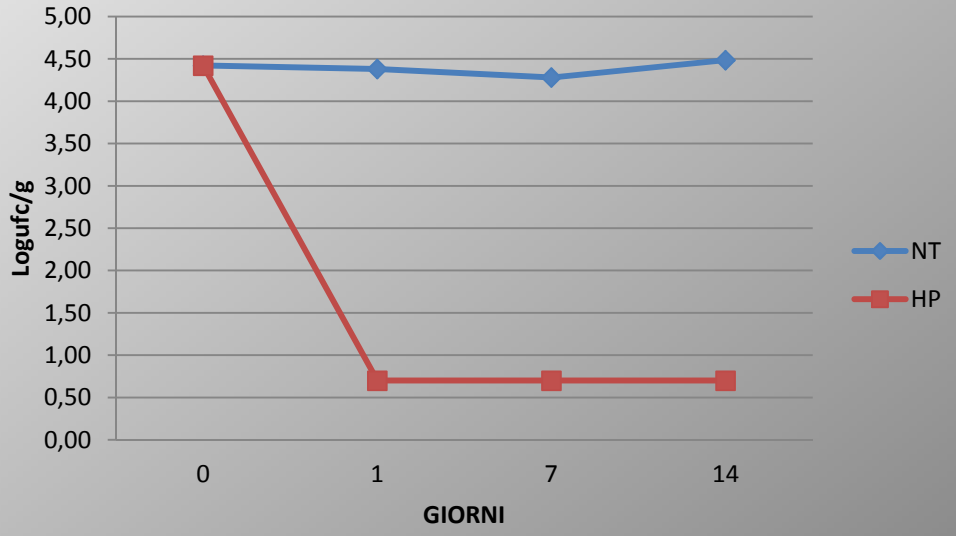
Porto-Fett, A., *et al. Int. J. Food Microbiol*. 140, 61-75 (2010).

PROSCIUTTO COTTO E HPP

Shelf-life a 4°C



MCT per *Listeria monocytogenes*



Teramo, 25/11/2014

GRAZIE PER L'ATTENZIONE!

Teramo, 25/11/2014