

Benvenuti a «MICROSALUBER»



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Benvenuti a «MICROSALUBER»

FACOLTÀ DI SCIENZE AGRARIE, ALIMENTARI E AMBIENTALI

Con il contributo di:



fondazione
cariplo

MICRO-SALUBER:
sale, salumi e salute.



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Sale: da strumento di potere a rischio per la salute





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Un argomento sotto la lente...



**IL SUINO:
DALL'ALLEVAMENTO
ALLA TAVOLA,
PASSANDO PER
LA TRASFORMAZIONE**

- 11:30** Modello di processo per la riduzione del sale nel prosciutto crudo.
Dr.ssa Roberta Virgili, Dr.ssa Cristina Schivazappa,
Dipartimento Carni SSICA, Parma.
- 11:50** Difetto di vena del prosciutto crudo: passi importanti verso la soluzione.
Dott.ssa M. Silvia Grisenti, Dr. ssa Silvana Barbuti,
Dipartimento Microbiologia SSICA. Parma
- 12:10** La metagenomica: un nuovo approccio per lo studio del difetto di vena nel prosciutto.
Dr. Stefano Biffan, Parco Tecnologico Padano. Lodi
- 12:30** Dalla nutrizione alla funzionalità: peptidi bioattivi nel prosciutto.
Prof. Gianni Galaverna, Università di Parma.

Seguirà un *vin d'honneur*
e una degustazione di prosciutto di San Daniele



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Ecology of antibiotic resistant coagulase-negative staphylococci isolated from the production chain of a typical Italian salami



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ABSTRACT

Bacteria carrying antibiotic resistance (AR) genes may represent a hazard for human health. The objective of this study was to evaluate the relationship between the origin, cell number, biotype, phenotypic and genotypic AR profile of coagulase-negative staphylococci (CNS) isolated from the production chain of *Salame Piacentino*. The 390 isolates were genetically ascribed to 98 different strains belonging to 13 *Staphylococcus* species: *Staphylococcus xylosum* and *Staphylococcus pasteurii* were the predominant followed by *Staphylococcus hominis*, *Staphylococcus cohnii* and *Staphylococcus epidermidis*. Eight antibiotic resistant strains, isolated from skin and salami samples, were detected in different steps along the manufacturing process. Determination of the minimum inhibition concentrations of all CNS strains showed a high frequency of phenotypic tetracycline and erythromycin (83.7% and 68.4% respectively) and a lower kanamycin (40.8%) resistant. The most frequently detected AR genes were *ermC* (37.8%), *tet(L)* and *tet(K)* (31.6% and 34.7% respectively) mainly in skin before washing with water at 65 °C and in faeces samples, but only *S. xylosum* harbouring *tet(K)* gene was detected during the salami ripening. Our findings show that, the production chain of *Salame Piacentino* is a source of antibiotic resistant CNS, but the salami manufacturing process leads a strong reduction of the antibiotic resistant strains and the hazard for human health.



Bacterial diversity in typical Italian salami at different ripening stages as revealed by high-throughput sequencing of 16S rRNA amplicons



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ABSTRACT

The bacterial diversity involved in food fermentations is one of the most important factors shaping the final characteristics of traditional foods. Knowledge about this diversity can be greatly improved by the application of high-throughput sequencing technologies (HTS) coupled to the PCR amplification of the 16S rRNA subunit. Here we investigated the bacterial diversity in batches of Salame Piacentino PDO (Protected Designation of Origin), a dry fermented sausage that is typical of a regional area of Northern Italy. Salami samples from 6 different local factories were analysed at 0, 21, 49 and 63 days of ripening; raw meat at time 0 and casing samples at 21 days of ripening were also analysed, and the effect of starter addition was included in the experimental set-up. Culture-based microbiological analyses and PCR-DGGE were carried out in order to be compared with HTS results. A total of 722,196 high quality sequences were obtained after trimming, paired-reads assembly and quality screening of raw reads obtained by Illumina MiSeq sequencing of the two bacterial 16S hypervariable regions V3 and V4; manual curation of 16S database allowed a correct taxonomical classification at the species for 99.5% of these reads. Results confirmed the presence of main bacterial species involved in the fermentation of salami as assessed by PCR-DGGE, but with a greater extent of resolution and quantitative assessments that are not possible by the mere analyses of gel banding patterns. Thirty-two different *Staphylococcus* and 33 *Lactobacillus* species were identified in the salami from different producers, while the whole data set obtained accounted for 13 main families and 98 rare ones, 23 of which were present in at least 10% of the investigated samples, with casings being the major sources of the observed diversity. Multivariate analyses also showed that batches from 6 local producers tend to cluster altogether after 21 days of ripening, thus indicating that HTS has the potential for fine scale differentiation of local fermented foods.

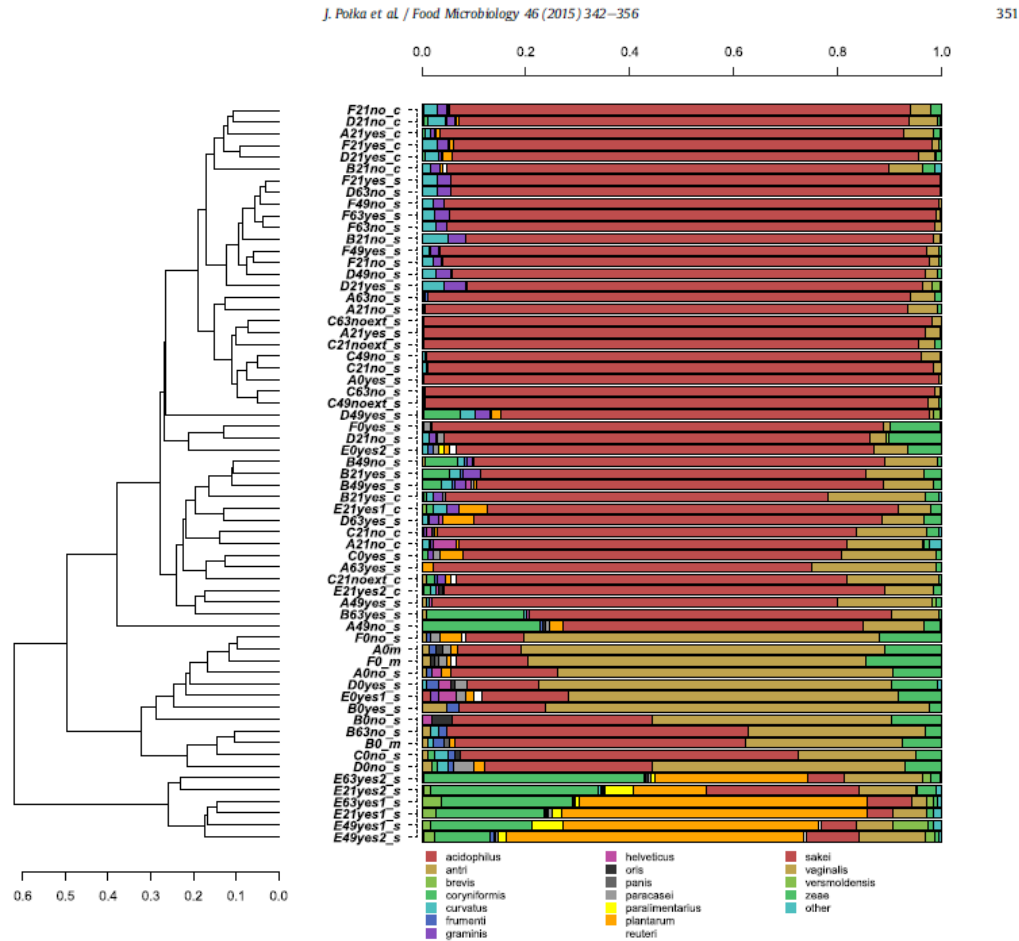


Fig. 5. Hierarchical clustering of classified sequences using the average linkage algorithm at the species classification level limited to sequences belonging to *Staphylococcus* genus. Taxa with participations lower than 1% were added to the "other" sequence group.



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Sale: da strumento di potere a rischio per la salute



Survey on Members States'

Implementation of the

**EU Salt Reduction
Framework**



Table 1
Legislative approaches to salt reduction

Country	Approach	Legal requirement	Year of introduction of law/modification
Belgium	Max. level	Royal decree: bread max. 2% salt on dry matter (1.7% at flour or 1.2-1.4% salt on final product); not applied to imported bread	1985
Bulgaria	Max. level	Special Ordinance for healthy nutrition at schools: all school buffets and canteens and Special Ordinance for healthy nutrition at kindergarten: all kindergarten canteens: there are special requirements for salt reduction.	2009 2011
		Standards for flour and bread - 3 type of flour and 3 typical national type of bread (s 1,2 g salt/100 g bread); Bulgarian State Standards for milk products (Bulgarian white cheese - white cheese in brine - 3,5 ± 0,5% salt, Bulgarian yellow cheese - yellow cheese "Kashkaval" - 1,8 - 3,0% salt); Approved standards "Stara planina" for meat and poultry products (s 2 g salt/100 g, for durable boiled smoked sausage - s 3,5 g salt/100 g, Approved Branch Standard for lutenica (product from processed tomato and vegetable mixture - s 1,7 g salt/100 g). Products produced according to Bulgarian State Standards should be with lower quantities of salt	2011-12
Finland	Warning label	National legislation on compulsory 'warning labelling' of high salt foods	From the 1980's Tightened 2009
	Max. level	National legislation on products entitled to EU's subsidies (School Milk Scheme): upper limit to salt content of eligible products (cheese in 1,3%)	2009
		Quality criteria for meals to get subsidies for meals at university restaurants, have to pass; were renewed and now contain limits for salt in main meals and all meal components	2011
Greece	Max. level	Food and Drinks Code of Greece: bread < 1.5% added salt Tomato juice: max. 1% salt Tomato concentrates: single concentration (i.e. tomato solids min. 22%) and semi-concentration (i.e. tomato solids at least 16%) max. 2% salt; double-concentration (i.e. tomato solids at least 26%) and triple concentration (i.e. tomato solids at least 36%) - packages of up to 10 Kg net weight max. 3% salt - packages of more than 10 Kg net weight max. 5% salt Concentrated Tomato puree paste: max. 4% salt	1971 Processed tomato products under revision.
		Nutrient profiles that serve as the scientific basis for legislation regarding the list of foods allowed to be sold in school canteens include sodium level requirements max. level of sodium in biscuits: 0.5 g/100g	2006 Revision in progress

Hungary	Max. level	Codex Alimentarius Hungaricus modified salt content for bread and some other bakery products (on dry matter): Certain bakery products (1-3/81-1): White bread: from 1.1.2015 >1.3%, < 2.5% from 1.1.2018 >1.3%, <2.35% Baked products (2-81): different bread: from 1.1.2015 >1.3%, < 2.5% from 1.1.2018 >1.3%, <2.35%	2012
	Tax	Act CIII on public health product tax: salty snacks with salt content exceeding 1g/100g and condiments (soup and other powders, artificial seasonings) above 5 g salt /100 g	2011
	Max. level	'Nutritional recommendation for mass caterers' issued by Chief Medical Officer in 2011 along with the Normative Order for the Government Office Policy Administration Services of Public Health (monitoring check list enabling to control compliance with recommendations); documents together form a draft proposal for a ministerial decree (ministerial decree is in progress)	Recommendation issued
Latvia	Max. level	Dietary standards in schools, kindergartens, long-term social care institutions and hospitals. Sausages, frankfurters, dried, smoked, salted meat and fish products, factory made ravioli, frozen manufactured meatballs and fish fingers, etc. are allowed once a week if they contain at least 70 % meat or 60 % fish, salt <1.25 g per 100 g of meat products and 1.5 g per 100 g of fish product. Amount of salt in the prepared meal is also limited	2012
Lithuania	Max. level	'Course of action for Nursery school, Primary and Secondary school children and Foster Home Nutrition', article 17 prohibits confectionary which contains sodium > 0,4 g/100g	2011
Netherlands	Max. level	Bread max. 2.5% salt on dry matter, tightened to max. 2.1% salt on dry matter (1.8% salt in flour). Per 2013 it will be tightened again to 1.8% salt on dry matter (1.5% in flour)	Beginning of 20th century /changed in 2009, next change in 2013
Portugal	Max. level	Bread ≤ 1.4g salt/100g	2009
	Tax	Value added tax on salty products	2012
Romania	Max. level	Ministerial Order 1563/2008: foods not recommended for school and pre-school children: food with salt content above 1.5 g salt/100 g or 0.6 g sodium/100 g (not allowed to be sold in schools)	2008
Slovak Republic	Max. level	National legislation, focus on salt in some food categories	1996 / currently preparing an amendment
Slovenia	Max. level	Nutritional recommendation for infants, kindergartens, schools, students, workers at the workplace and hospitals. Nutritional recommendation for salt content in bread and meat products.	2010
UK: Wales	Max. level	mandatory requirements for foods vended in hospitals requiring hospital caterers to vend lower salt products (as defined by FSA traffic light labelling criteria)	



Figure 1
Map with estimates of daily salt intakes (in g) of adults in European countries participating in the Framework

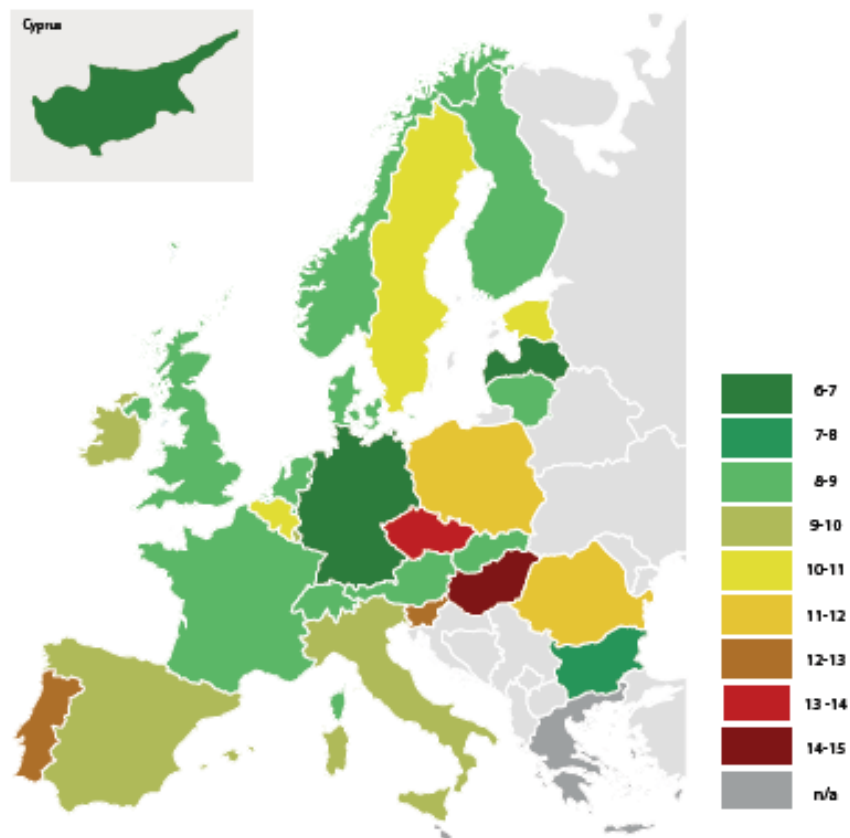
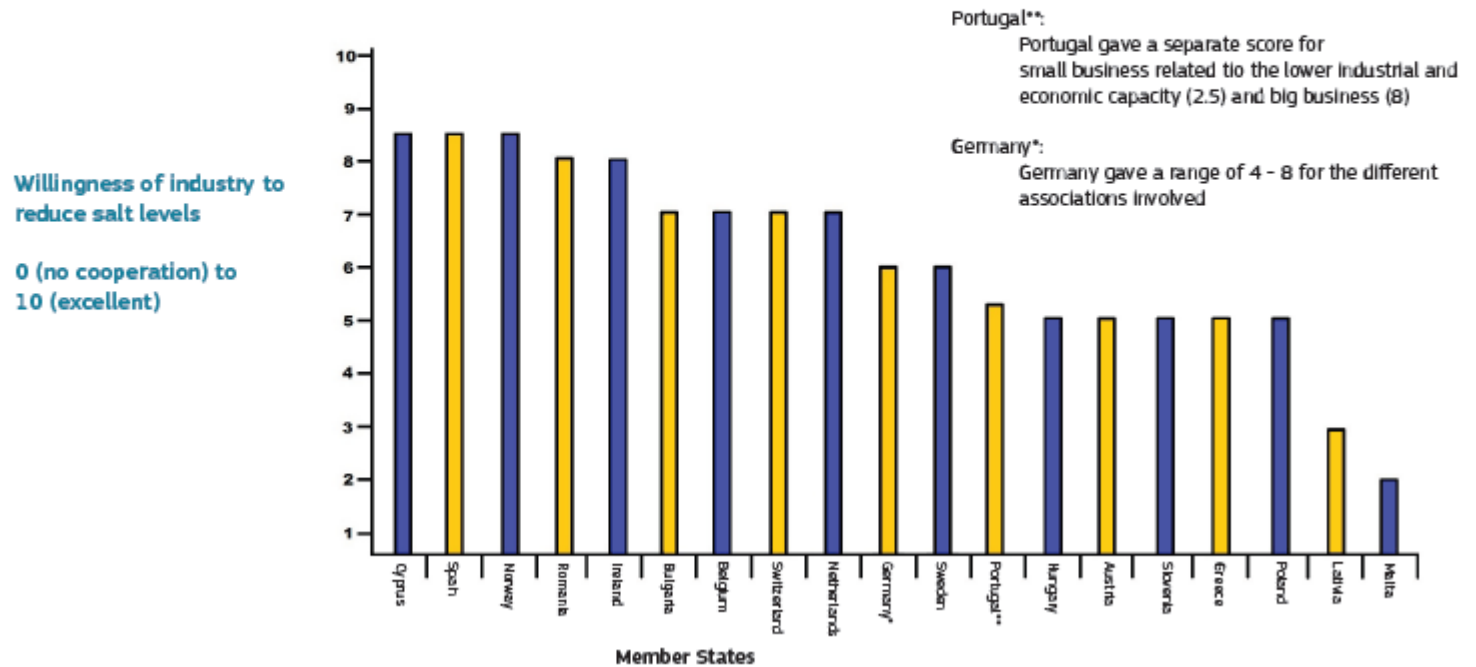




Figure 2
Member States' evaluation of the willingness of food business operators or their associations to reduce salt levels in their products on a scale from 0 (no cooperation) to 10 (excellent)





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