

CULTURES TASTE TECHNOLOGY®
MADE IN GERMANY



CULTURES FOR /Fish

We refine food.

M-CULTURE®

PROTECTIVE CULTURES FOR THE FISH PRODUCTION

THE INNOVATION FOR SALMON PRODUCTS

M FOOD GROUP® has succeeded in developing the activation medium TopSafe MC-AC-100 which is especially tailored for the protective culture M-CULTURE® Safe 4100. The combination of both products ensures microbiological stabilisation of salmon products. The activation guarantees protection against Listeria and is characterized by:



SIMPLE AND SECURE HANDLING

The activation takes place at room temperature. For this, the medium TopSafe MC-AC-100 is dissolved in water and the protective culture M-CULTURE® Safe 4100 is added to this solution.



EASY QUALITY CONTROL

By measuring the final pH-value of the culture after activation, it can be ensured that the process has been completed successfully.



OPTIMAL BACTERIOCIN FORMATION

Through the activation of the cultures contained in the protective culture M-CULTURE® Safe 4100, the antilisterial effect is optimally exploited.



OPTIMAL SPECTRUM OF ACTIVITY

The produced bacteriocins are able to inactivate a wide range of Listeria.

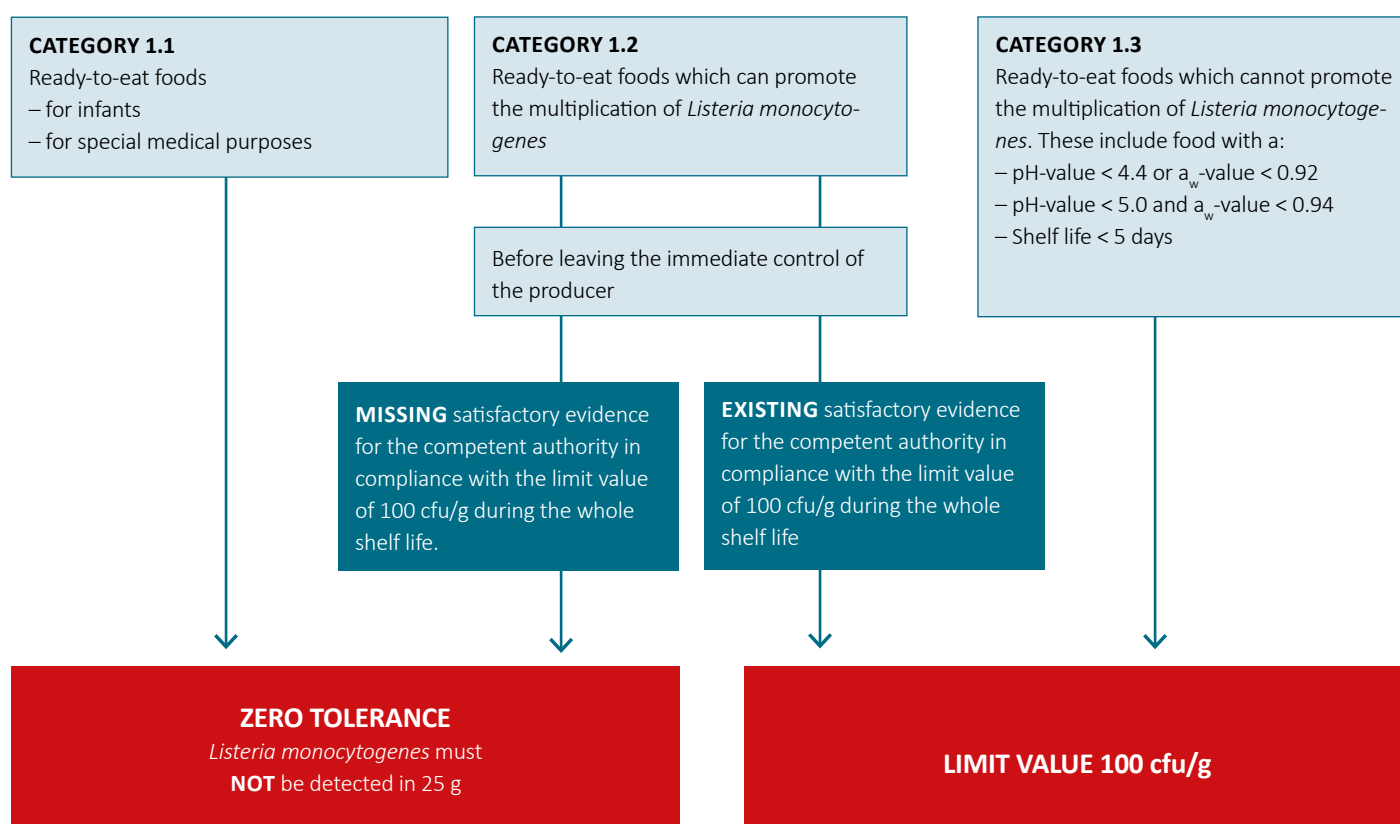


Product	Art. No.	Group
M-CULTURE® Safe 4100	44.00454	Protective culture
TopSafe MC-AC-100	44.88000	Activation medium



THE EUROPEAN-REGULATION NO. 2073/2005

REGARDING LISTERIA MONOCYTOGENES



DID YOU KNOW...

... that all M-CULTURE® starter and protective cultures are produced on in-house fermenters and then produced in the in-house class 10 clean room?.

The most important working steps take place under laminar flow which guarantees a completely safe production without any foreign germs. Furthermore, all cultures are tested for quality and effectiveness in our in-house laboratory and by external accredited laboratories:

DOCUMENTATION OF EFFECTIVENESS

The effectiveness of the antilisterial activity of the M-CULTURE® Safe 4100 in salmon products has been documented in a Challenge study. The implementation of the study was carried out in accordance with the european guideline documents for studies with *Listeria monocytogenes*.

EXPERIMENTAL PROCEDURE

Fresh salmon fillet was cut into 200g pieces. After dissolving the activation medium TopSafe MC-AC-100 in water, the inoculation with the protective culture M-CULTURE® Safe 4100 was carried out.

After an incubation time of 24 hours at room temperature, the salmon pieces were marinated in the activation medium solution and stored for 6 hours at refrigeration temperature (refrigeration cell). Then they were taken out of the solution and after an addition of a salt-sugar mixture (surface treatment) the salmon pieces were wrapped in foil. Subsequently maturing took place at 6.5°C for 48 hours.

After maturing, the salmon pieces were cut and the cut surface was contaminated with the cold adapted *Listeria* pool (50cfu/g). Finally, the slices were vacuum-packed and stored for 28 days at 6.5°C.



DOCUMENTATION OF EFFECTIVENESS

SUMMARY & CONCLUSION

The used culture had an impact on both, the growth behavior of the *Listeria* and the development of the total bacterial flora.

The bacterial flora, which is dominated by lactic acid bacteria in these products, increased as expected in the untreated products during storage. The cell densities in the treated samples remained on a constant level due to the use of the protective culture.

The *Listeria* cell count in the untreated samples increased during the 28 days cold storage from 75 cfu/g (contamination density) up to 100.000 cfu/g.

THROUGH THE ADDITION OF THE PROTECTION CULTURE, GROWTH OF LISTERIA WAS COMPLETELY SUPPRESSED.

With this Challenge study it was demonstrated that, under the given circumstances (kind and quality of the raw material, process- and storage conditions), the requirements of the hygiene regulation have been met and, therefore, satisfactory evidence for the competent authority that the product does not exceed the value of 100 cfu/g during its whole shelf life has been delivered.

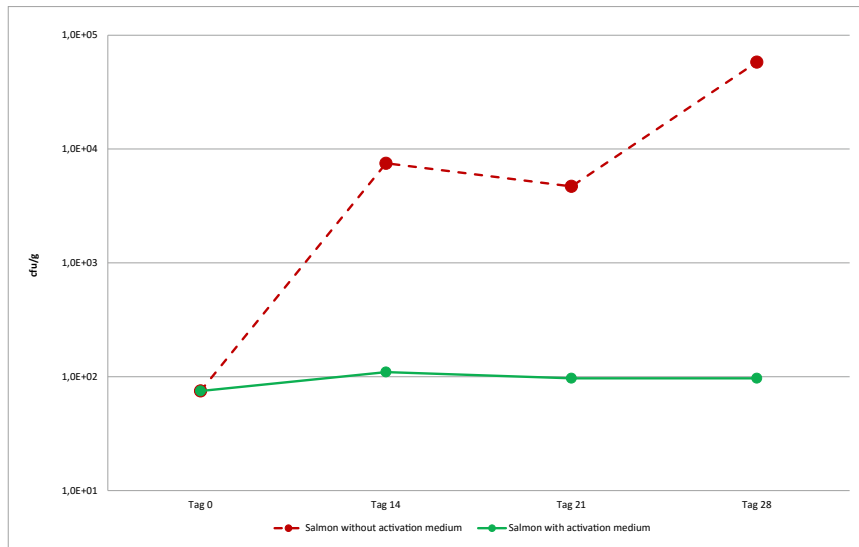
A limit value of 100 cfu/g for *Listeria monocytogenes* during the whole shelf life is valid for products placed on the market. A separate proof through a Challenge study is required for changed process conditions.



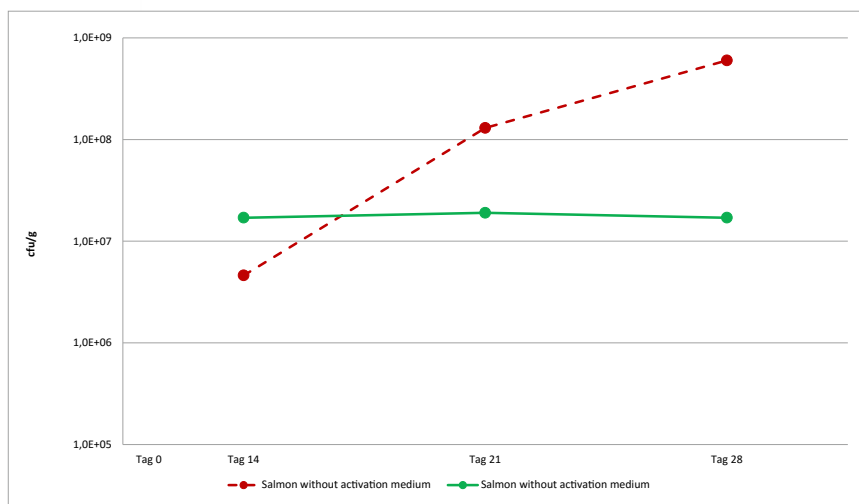
RESULTS

	day 0		day 14		day 21		day 28	
	OCLA ctu/g	MRS ctu/g	OCLA ctu/g	MRS ctu/g	OCLA ctu/g	MRS ctu/g	OCLA ctu/g	MRS ctu/g
Salmon without activation medium								
A-1	7,5E+01	5,0E+03	8,0E+02	4,7E+05	3,7E+03	1,1E+08	9,8E+04	5,5E+08
A-2		7,6E+03	6,0E+03	4,0E+06	5,2E+03	1,5E+08	3,7E+04	6,2E+08
A-3		4,8E+03	9,0E+03	5,1E+06	5,3E+03	1,3E+08	4,0E+04	6,3E+08
Salmon with activation medium								
B-1	7,5E+01		8,0E+01	1,7E+07	4,0E+01	1,2E+07	1,2E+02	2,4E+07
B-2			1,0E+02	1,5E+07	2,0E+02	3,6E+07	1,0E+02	1,3E+07
B-3			8,0E+01	1,9E+07	5,0E+01	1,0E+07	7,0E+01	1,5E+07

Cell densities *Listeria* [OCLA] and lactic acid bacteria [MRS]:



Growth of *Listeria* in unprotected (RED) and protected (GREEN) samples, cold storage of 28 days.



Growth of lactic acid bacteria in unprotected (RED) and protected (GREEN) samples, cold storage of 28 days.

Labor

ISI FOOD PROTECTION ApS

CENTRE OF EXPERTISE FOR

APPLIED FOOD MICROBIOLOGY

Akkreditiert nach ISO17025

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