

CULTURES TASTE TECHNOLOGY®
MADE IN GERMANY



CULTURES FOR **/Meat**
CULTURES FOR **/Veggie & Fresh**



We refine food.

CULTURES TASTE TECHNOLOGY®
MADE IN GERMANY



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/Meat

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/Veggie & Fresh

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M-CULTURE® STARTER- & PROTECTIVE CULTURES

Meat- and sausage products provide, like many other foods, an ideal breeding ground for both beneficial and harmful microorganisms such as bacteria, yeasts and fungi. Harmful microorganisms and pathogenic germs spoil food up to full inedibility, which can lead to dangerous food-borne infections. On the other hand, beneficial microorganisms are not only able to suppress spoilage microorganisms and therewith increase food safety, they also significantly improve colour and taste of the products.



MATURATION, STABILISATION & PROTECTION

Starter cultures are microorganisms that support the fermentation process of raw sausage products and raw cured products with their microbiological and enzymatic properties in many ways. M-CULTURE® starter- and protective cultures from Meat Cracks meet the highest standards of the sausage- and meat industry. They ensure best fermentation results, promote outstanding sensory properties and guarantee optimal product safety.

A defined and standardised addition of M-CULTURE® starter cultures contributes to:

- Best possible reproducibility
- Optimal process control
- Highest product safety and quality
- Advantage in process speed

Moreover, M-CULTURE® protective cultures are effective in the following key areas:

- Effect of competitive inhibition (inhibition effect)
- pH-value reduction caused by lactic acid bacteria for suppression of pathogenic microorganisms
- Formation of antagonistic metabolites (bacteriocins) and inhibition of gram-positive bacteria such as listeria

M FOOD GROUP[®]

CULTURES

SPECIALLY TAILORED TO YOUR REQUIREMENTS

Through M FOOD GROUP[®], customers have the possibility to develop and produce customized cultures.

M FOOD GROUP[®] offers:

- Broad range of different, customizable culture strains
- Definition of the exactly required range of services
- Development and production of specifically optimized culture mixtures
- Private labels

Competent advice and complete service:

- Many years of experience
- Very fast development times
- Consideration of individual flavours
- Optimization of raw- and auxiliary materials
- Test productions
- Targeted production support



The user is always on the safe side with M FOOD GROUP[®] M-CULTURE[®] starter- and protective cultures. They ensure best fermentation results in the production of raw sausage products and raw cured products, promote outstanding sensory properties and guarantee optimal product safety.

LEUCONOSTOC CARNOSUM

M-CULTURE® SAFE GDS® 3349®

WHAT MAKES IT SO UNIQUE? The protective cultures found on the market are mainly used in fermented food products. The BioProtection 2.0 concept aims to make it possible to protect non-fermented foods from undesirable micro-organisms too.



WHAT CAN IT DO?

M-CULTURE® SAFE GDS® 3349® ...



...is a global innovation

The protective cultures found on the market are mainly used in fermented food products.



...is proven not to form bacteriocins



...represents "BioProtection 2.0"

The "BioProtection 2.0" concept aims to make it possible to protect non-fermented foods from undesirable microorganisms too.



...dominates

the microflora in the product through competitive inhibition



...is classified as a food ingredient

rather than an additive: It can be labelled as a "lactic acid bacterium", "*Leuconostoc carnosum*" or a "protective culture".



...is substrate-specific



...is perfect for cooked ham and bacon



...ensures stable pH levels



...enhances sensory properties



...does not change product colour



...is organic



...protects against listeria

Prompts a "log reduction" in listeria in cooked ham & bacon



...is suitable for Clean Labelling



...has a persuasively attractive price



WHAT PROOF IS THERE?

ISI test report - cooked ham

Challenge study involving *listeria monocytogenes* in cooked ham cold cuts packed in a modified atmosphere
Dr. Dieter Elsser-Gravesen, ISI FOOD PROTECTION ApS, Aarhus, Denmark

ISI test report - bacon

Challenge study involving *listeria monocytogenes* in bacon, smoked cuts packed in a modified atmosphere
Dr. Dieter Elsser-Gravesen, ISI FOOD PROTECTION ApS, Aarhus, Denmark

Assessment of M-CULTURE® Safe GDS® 3349®

Summary of findings from the research series: Application of M-CULTURE® Safe GDS® 3349® on cooked ham and bacon
Institut Bilacon, Rheda Wiedenbrück, Germany

Memo on description/declaration

Executive summary of the main audit results of our evaluation of the food law governing the application of *Leuconostoc carnosum* GDS®3349® on foodstuffs.
cibus Rechtsanwälte, Gummersbach, Germany

Would you like to read them yourself?

We would be happy to send you all or some of the references.



M-CULTURE® CF 10

THE NITRATE REDUCER

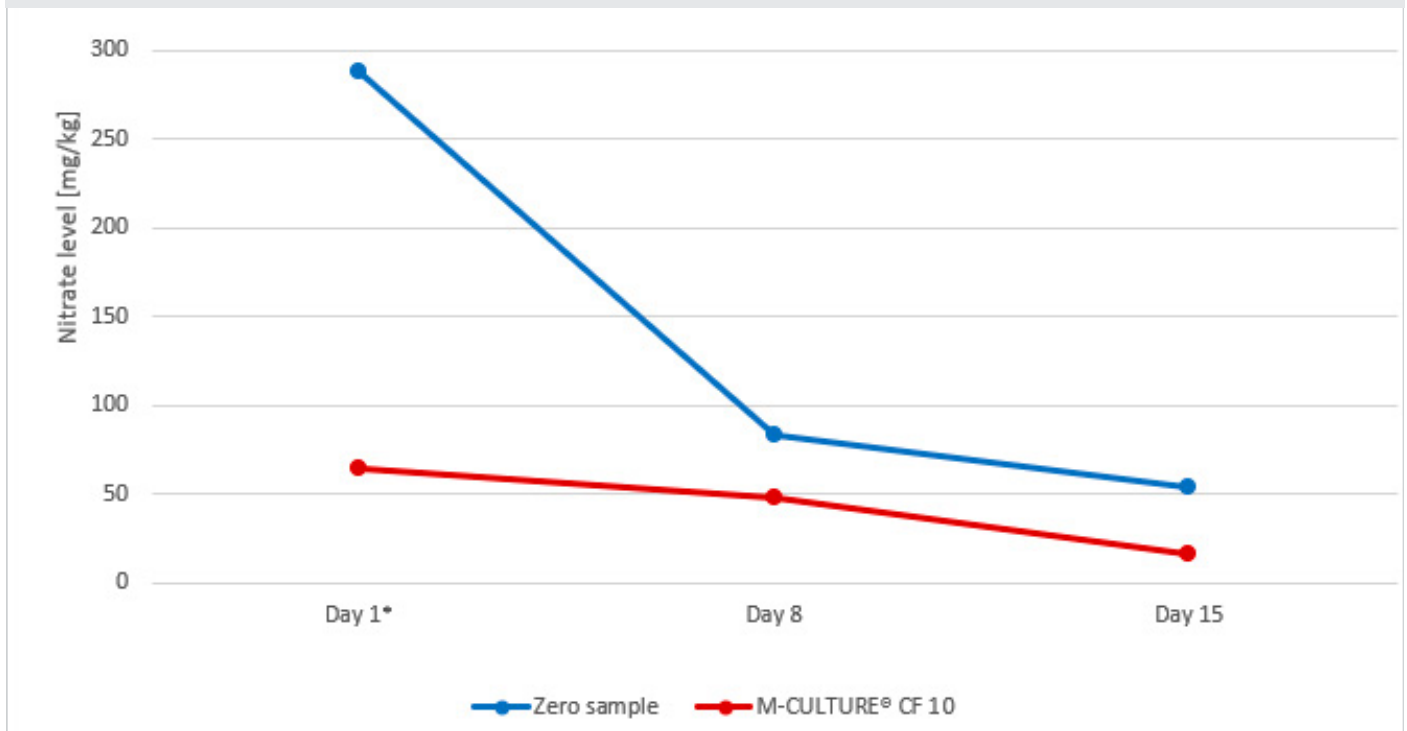
Art.-No.	Name	Composition	Appliation	Packaging
43.00010	M-CULTURE® CF 10	• Staph equorum	– all raw cured products requiring fast, intensive colouring, with short processing times – Optimum application at < 5°C	20 g (for 100 kg)
44.00454	M-CULTURE® Safe 4100	• Lb plantarum	– For all raw cured products requiring secure protection against listeria	20 g (for 100 kg)

OUR NEW ARRIVAL FOR RAW CURED PRODUCTS:

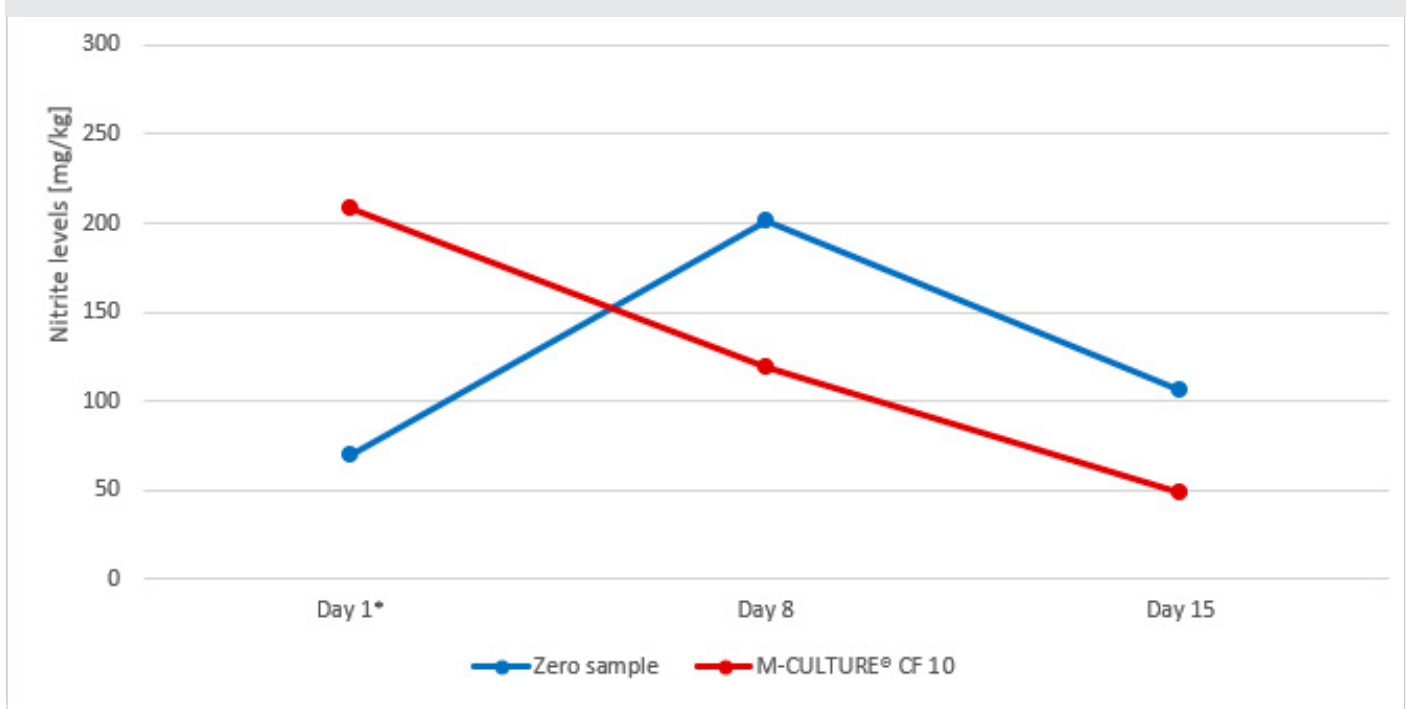
M-CULTURE® CF 10 - the nitrate reducer - forms a distinctively strong curing colour, in a shorter processing time, thanks to its high level of enzyme activity. The large number of proteases and lipases ensure a unique flavour at low curing temperatures (< 5°C).

Using new nitrate reductase active strains leads to a reduced amount of residual nitrates and nitrites. The biological culture is labelled as “starter culture” or “ripening culture” in the end product.

Development of nitrate levels with and without starter culture



Development of nitrite levels with and without starter culture



By using the M-CULTURE[®] CF 10 the content of nitrate could be reduced to < 60 ppm.

*Day 1 = measurement within the first 24 h



M-CULTURE® CF [COLOUR & FLAVOUR]

COLOUR- AND FLAVOUR FORMING CULTURES

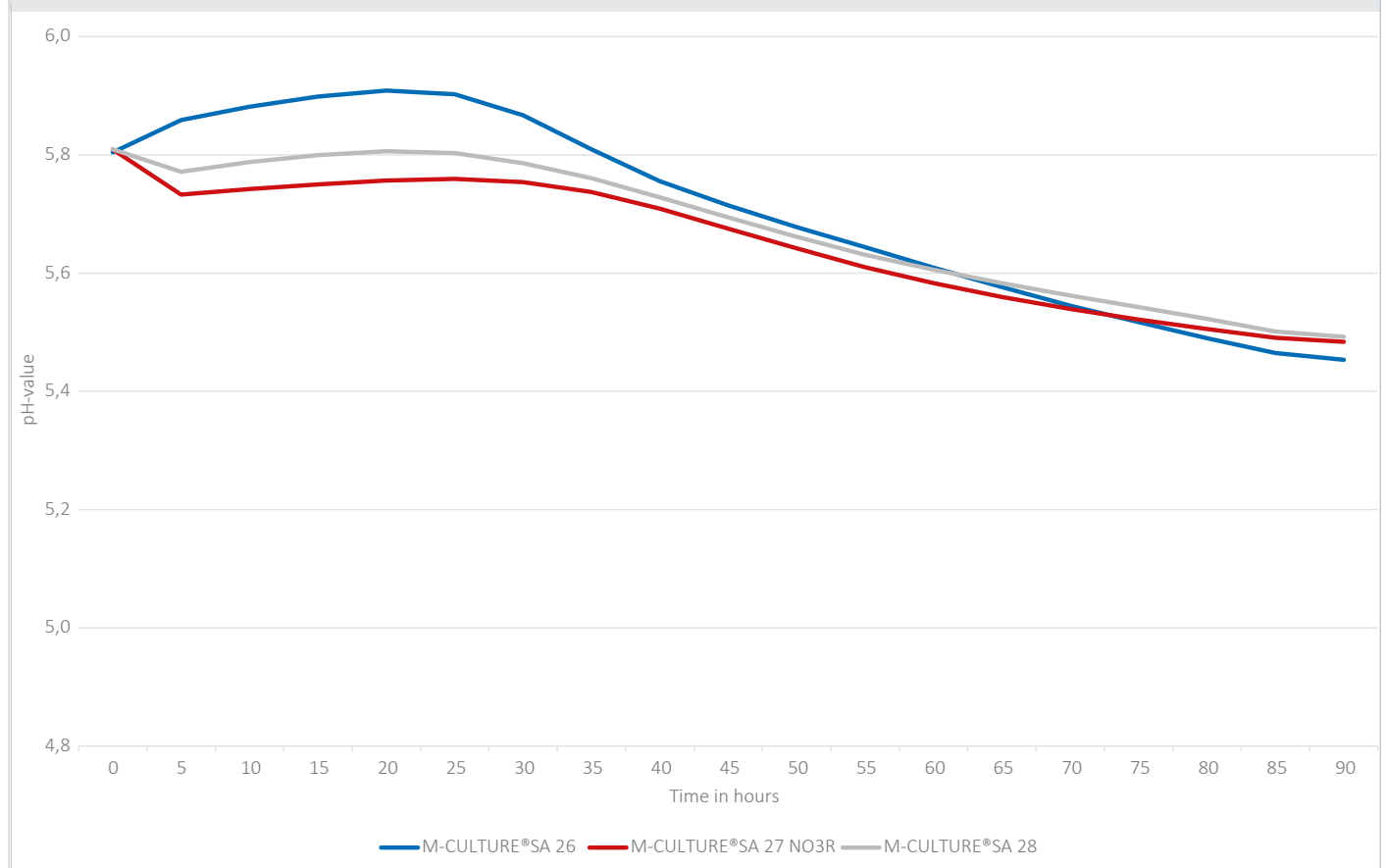
Art.-No.	Name	Composition	Application	Packaging
44.00005	M-CULTURE® CF 11	• <i>Staph. carnosus</i>	– For all types of raw sausages and raw ham requiring good colour formation	20 g (for 100 kg)
44.00016	M-CULTURE® CF 12	• <i>Staph. xylosus</i>	– For all types of raw sausages and raw ham requiring good colour formation	20 g (for 100 kg)
44.00121	M-CULTURE® CF 96	• <i>K. salsicia</i> • <i>Staph. carnosus</i>	– For all types of raw sausages and raw ham requiring very good flavour formation and reddening	25 g (for 100 kg)
44.00126	M-CULTURE® CF 97	• <i>K. salsicia</i> • <i>Staph. carnosus</i>	– For all types of raw sausages and raw ham requiring increased nitrate reduction and flavour formation – Also suitable for nitrite curing salt free products	25 g (for 100 kg)

M-CULTURE® SA [SLOW ACIDIFICATION]

SLOW ACIDIFYING STARTER CULTURES

Art.-No.	Name	Composition	Application	Packaging
44.00012	M-CULTURE® SA 26	<ul style="list-style-type: none"> • <i>Pd. acidilactici</i> • <i>Lb. plantarum</i> • <i>Staph. carnosus</i> 	<ul style="list-style-type: none"> – For all types of raw sausages and raw ham requiring mild acidification – Good reddening 	20 g (for 100 kg)
44.00232	M-CULTURE® SA 27 NO3R	<ul style="list-style-type: none"> • <i>Pd. acidilactici</i> • <i>Lb. plantarum</i> • <i>Staph. carnosus</i> • <i>K. salsicia</i> 	<ul style="list-style-type: none"> – For all types of raw sausages and raw ham requiring mild acidification – High nitrate reductase – Good flavour 	20 g (for 100 kg)
44.00079	M-CULTURE® SA 28	<ul style="list-style-type: none"> • <i>Staph. xylosus</i> • <i>Staph. carnosus</i> • <i>Lb. plantarum</i> 	<ul style="list-style-type: none"> – For all types of raw sausages and raw ham, especially French and Italian salami, requiring mild acidification – Good reddening – Characteristic flavour – Top-Seller 	20 g (for 100 kg)
44.00082	M-CULTURE® SA 29	<ul style="list-style-type: none"> • <i>Staph. xylosus</i> • <i>Staph. carnosus</i> • <i>Db. hansenii</i> 	<ul style="list-style-type: none"> – For all types of raw ham requiring fast reddening and good flavour – Does not contain acidifying culture strains 	20 g (for 100 kg)

Acidification curves of some slow acidifying M FOOD GROUP® starter cultures:

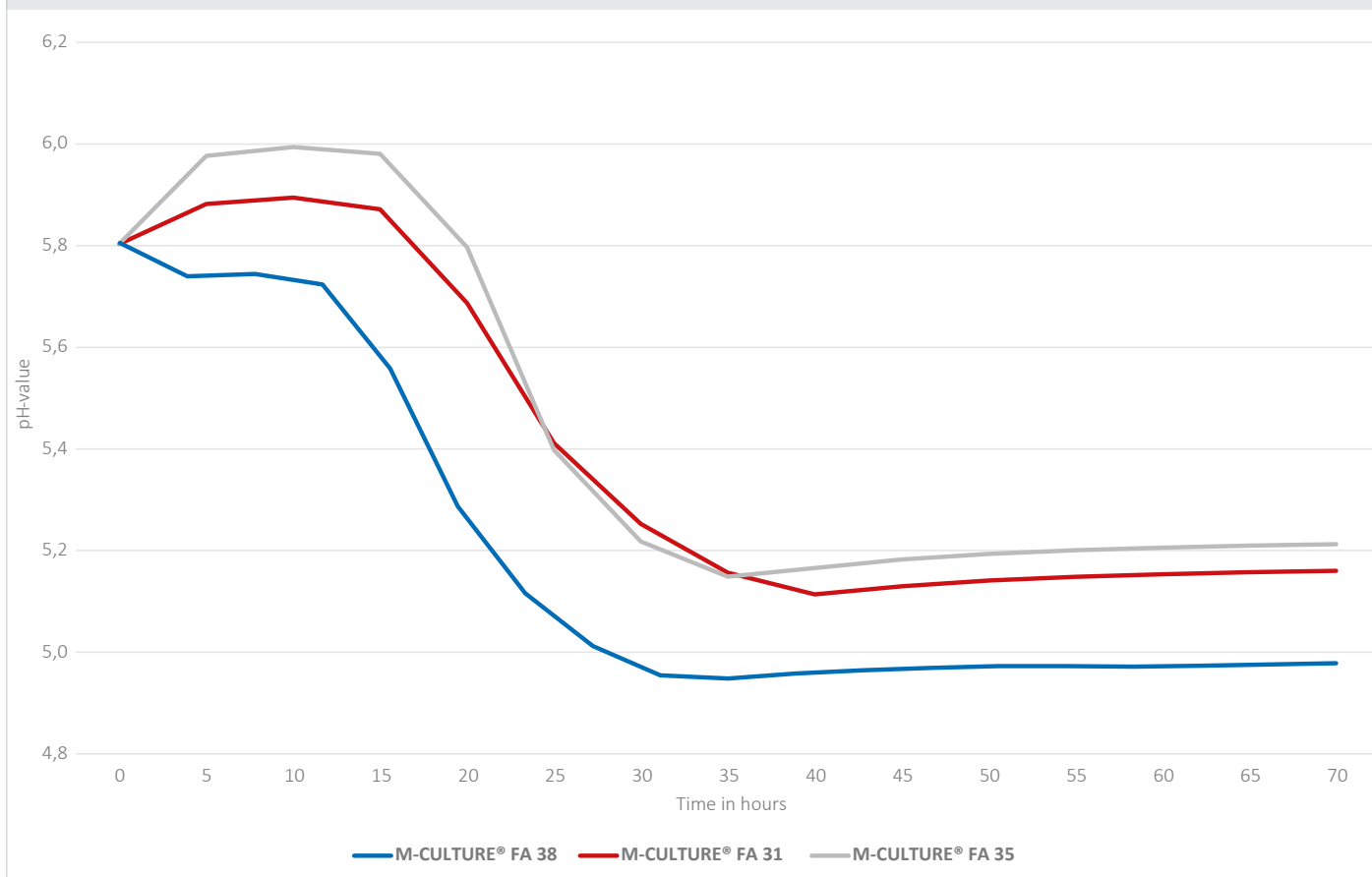


M-CULTURE® FA [FAST ACIDIFICATION]

FAST ACIDIFYING STARTER CULTURES

Art.-No.	Name	Composition	Application	Packaging
44.01153 44.00150 44.01154 44.00053	M-CULTURE® FA 38	<ul style="list-style-type: none"> • <i>Staph. carnosus</i> • <i>Staph. xylosus</i> • <i>Lb. curvatus</i> • <i>Pd. pentosaceus</i> • <i>Db. hansenii</i> 	– For all types of sliceable raw sausages requiring very fast acidification and characteristic flavour – Top-Seller	20 g (for 100 kg) 30 g (for 150 kg) 40 g (for 200 kg) 200 g (for 1000 kg)
44.00013	M-CULTURE® FA 31	<ul style="list-style-type: none"> • <i>Staph. carnosus</i> • <i>Staph. xylosus</i> • <i>Lb. curvatus</i> 	– For all types of sliceable raw sausages requiring fast acidification and good reddening (Minisalami/Pfefferbeißer)	20 g (for 100 kg)
44.00004	M-CULTURE® FA 35	<ul style="list-style-type: none"> • <i>Pd. pentosaceus</i> • <i>Lb. plantarum</i> • <i>Staph. xylosus</i> 	– For all types of sliceable raw sausages, from small to big calibers, requiring fast acidification – Broad spectrum culture	20 g (for 100 kg)

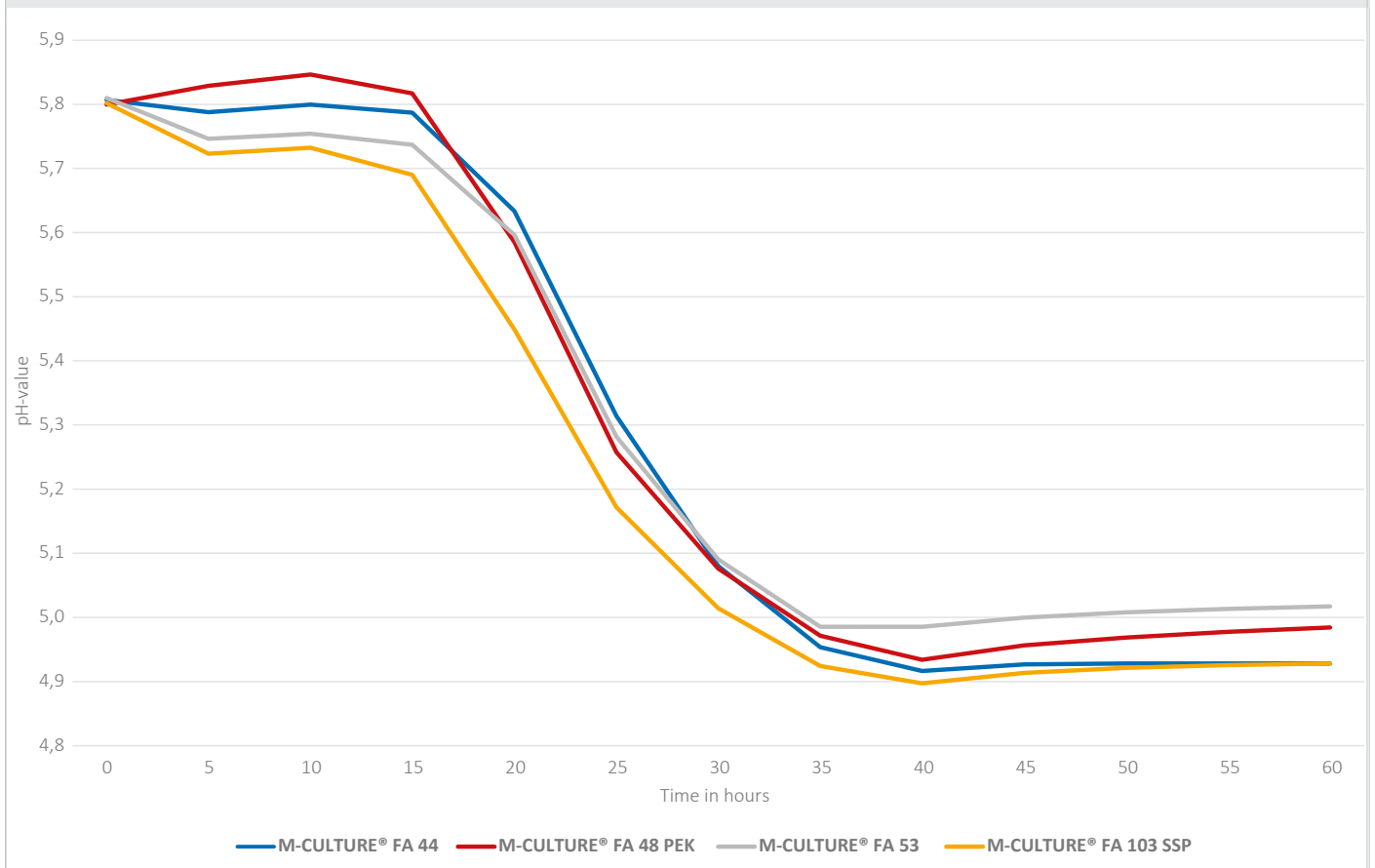
Acidification curves of some fast acidifying M FOOD GROUP® starter cultures:





Art.-No.	Name	Composition	Application	Packaging
44.00077 44.00065	M-CULTURE® FA 44	<ul style="list-style-type: none"> • <i>Staph. carnosus</i> • <i>Staph. xylosum</i> • <i>Lb. curvatus</i> • <i>Lc. lactis</i> • <i>Db. hansenii</i> 	<ul style="list-style-type: none"> – For all types of sliceable raw sausages requiring very fast acidification and characteristic flavour – Optimal gelation 	50 g (for 100 kg) 100 g (for 200 kg)
44.00019 44.00048	M-CULTURE® FA 48 PEK	<ul style="list-style-type: none"> • <i>Staph. carnosus</i> • <i>Staph. xylosum</i> • <i>Lb. curvatus</i> • <i>Lc. lactis</i> • <i>Db. hansenii</i> 	<ul style="list-style-type: none"> – For all types of sliceable raw sausages requiring very fast acidification and mild flavour – Optimal gelation – Cost-efficient culture 	50 g (for 100 kg) 100 g (for 200 kg)
44.00301	M-CULTURE® FA 53	<ul style="list-style-type: none"> • <i>Lb. curvatus</i> • <i>Staph. carnosus</i> 	<ul style="list-style-type: none"> – For all types of sliceable raw sausages requiring fast acidification and good reddening – "Fast Track" 	20 g (for 100 kg)
44.00330 44.00332 44.00335	M-CULTURE® FA 103 SSP	<ul style="list-style-type: none"> • <i>Lb. curvatus</i> • <i>Lb. sakei</i> • <i>Staph. carnosus</i> 	<ul style="list-style-type: none"> – For all types of sliceable raw sausages requiring fast acidification and good reddening – Top-Seller 	20 g (for 100 kg) 30 g (for 150 kg) 40 g (for 200 kg)

Acidification curves of some fast acidifying M FOOD GROUP® starter cultures:

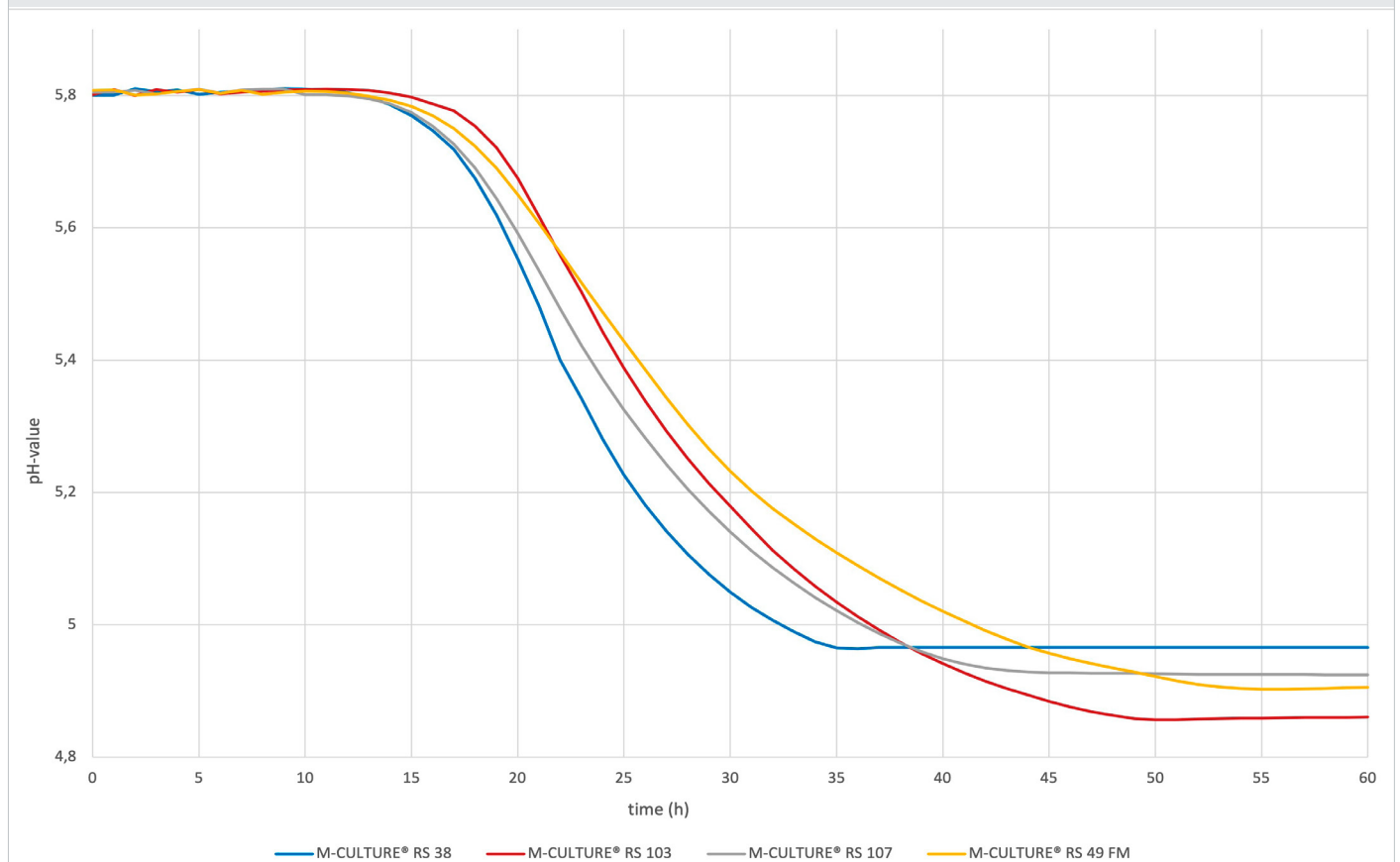


M-CULTURE® RS [RIPENING & SAFE]

COMBINATION OF RIPENING & PROTECTIVE CULTURES

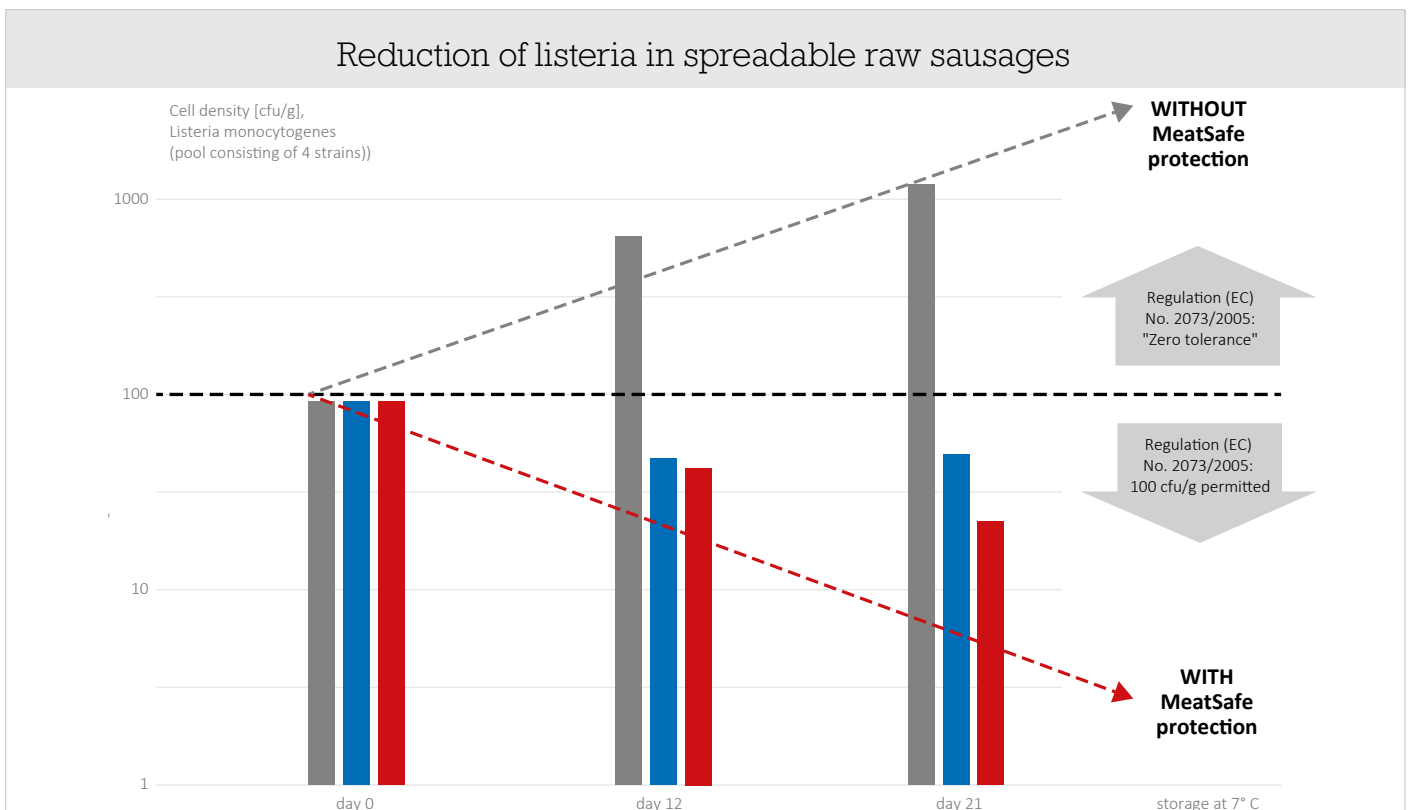
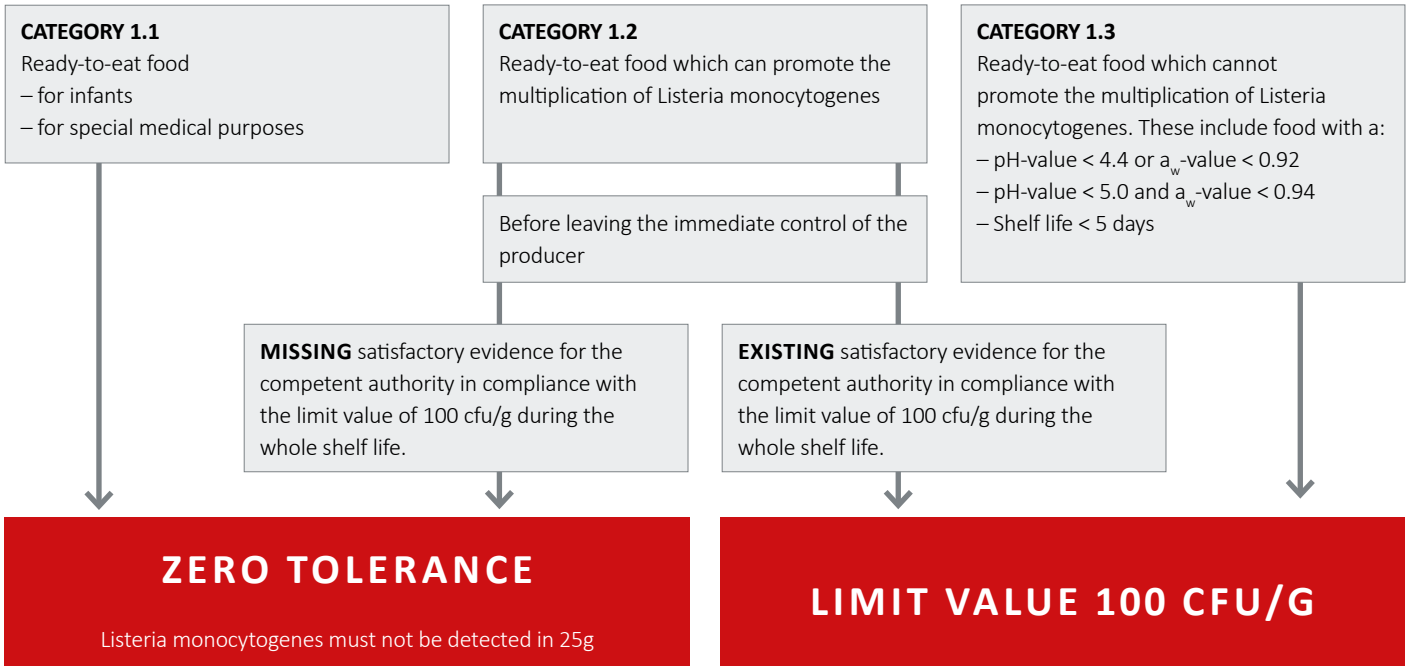
Art.-No.	Name	Composition	Application	Packaging
44.00619 44.00617 44.00609	M-CULTURE® RS 38	<ul style="list-style-type: none"> • <i>Lb. curvatus</i> • <i>Lb. plantarum</i> • <i>Pd. pentosaceus</i> • <i>Staph. carnosus</i> • <i>Staph. xylosus</i> • <i>Db. hansenii</i> 	<ul style="list-style-type: none"> – For all types of sliceable raw sausages from small to big calibers requiring very fast acidification, characteristic flavour and special protection against listeria – Broad spectrum culture 	20 g (for 100 kg) 40 g (for 200 kg) 60 g (for 300 kg)
44.00646 44.00632 44.00635	M-CULTURE® RS 103	<ul style="list-style-type: none"> • <i>Lb. curvatus</i> • <i>Lb. plantarum</i> • <i>Lb. sakei</i> • <i>Staph. carnosus</i> 	– For all types of sliceable raw sausages requiring fast and good reddening and special protection against listeria	20 g (for 100 kg) 40 g (for 200 kg) 200 g (for 1000 kg)
44.00636 44.00637	M-CULTURE® RS 107	<ul style="list-style-type: none"> • <i>Lb. curvatus</i> • <i>Lb. plantarum</i> • <i>Lb. sakei</i> • <i>Staph. carnosus</i> 	<ul style="list-style-type: none"> – For all types of sliceable raw sausages requiring fast and good reddening and special protection against listeria – Top-Seller 	20 g (for 100 kg) 40 g (for 200 kg)
43.07000	M-CULTURE® RS 49 FM	<ul style="list-style-type: none"> • <i>Db. hansenii</i> • <i>K. salsicia</i> • <i>Lb. sakei</i> • <i>Lb. plantarum</i> 	<ul style="list-style-type: none"> – types of sliceable raw sausages requiring mild acidification, good colour stability, prolonged fat stability and the development of a typical Mediterranean flavour. – Special protection against listeria 	100 g (for 100 kg)

Acidification curves of some M FOOD GROUP® ripening and protective cultures:



THE EU-REGULATION

NR. 2073/2005 – REGARDING LISTERIA MONOCYTOGENES





M-CULTURE® SAFE 5100 TZM

Zwiebelmettwurst (spreadable cured sausage) and similar products belong to a highly sensitive group of products that may encourage the growth of listeria as a result of how they are manufactured, matured and stored. **M-CULTURE® Safe 5100 TZM** guarantees a reduction in listeria growth and is also easy and safe to use: the culture is added dry at the start of the production process.

Its effect is proven in a Challenge Study involving *Listeria monocytogenes* in Zwiebelmettwurst.

EXTRACT FROM THE CHALLENGE STUDY:

„In reference samples (without using a protective culture), there was a growth of listeria during the maturation/colour development phase and its subsequent cold storage (at + 7 °C for 28 days), as is typical for the product group. The listeria increased from a contamination density of 22 KbE/g to an average of 1,150 KbE/g; this corresponds to a growth potential δ of + 0.76 LOG10 KbE/g.

In the samples in which the protective culture M-CULTURE® Safe 5100 TZM was applied at a dosage of 0.5 g/kg, there was no listeria growth throughout the entire test phase. At the end of the storage period (Day 30), the listeria density remained negligible at a contamination density of (δ = - 0.19 LOG10).”



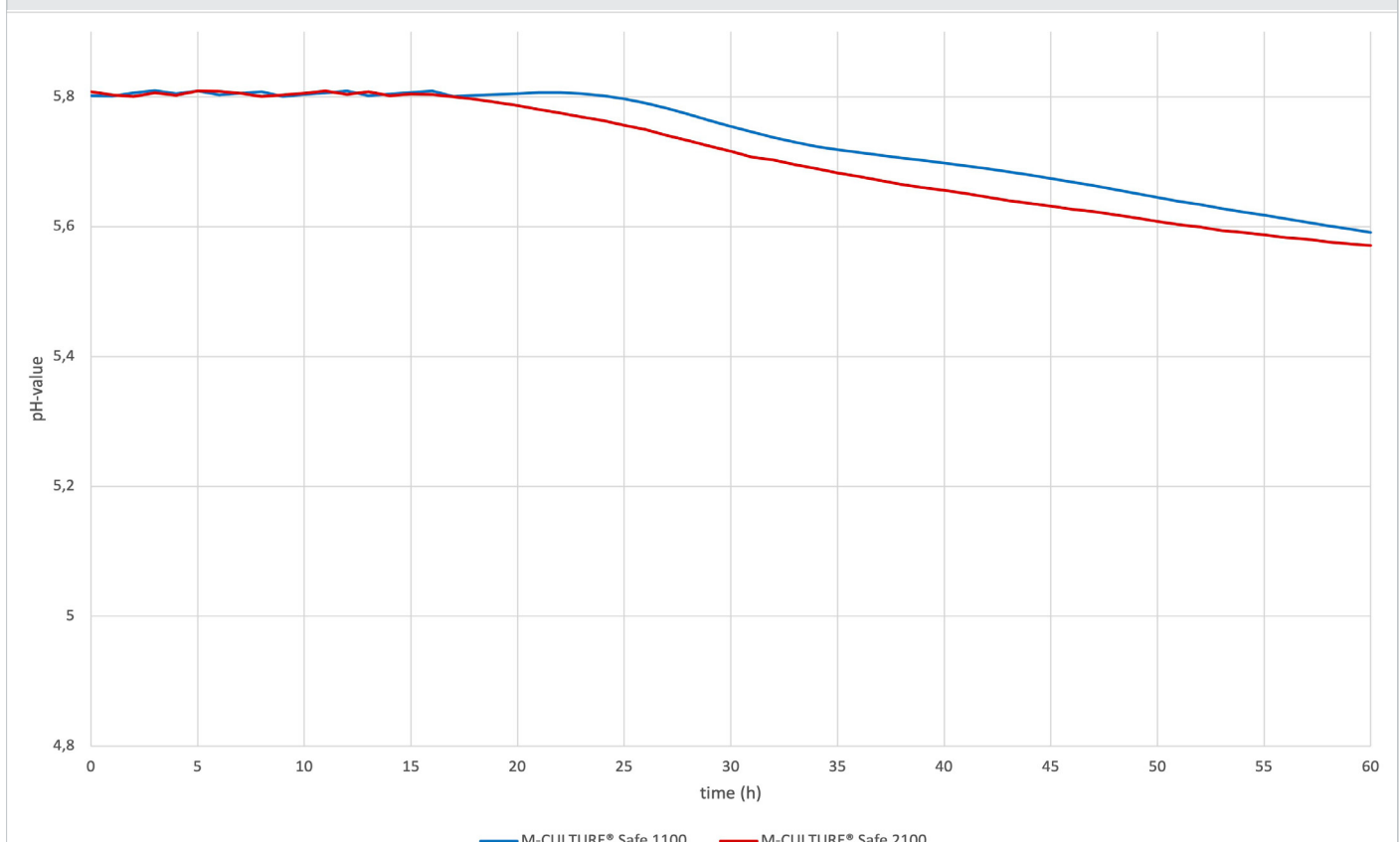
ISI test report – Zwiebelmettwurst; Challenge Study involving *Listeria monocytogenes* in Zwiebelmettwurst (spreadable cured sausage)
Dr. Dieter Elsser-Gravesen, ISI FOOD PROTECTION ApS, Aarhus, Denmark

M-CULTURE® SAFE [SAFETY]

PROTECTIVE CULTURES

Art.-No.	Name	Composition	Application	Packaging
44.00154 44.00157	M-CULTURE® Safe 1100	<ul style="list-style-type: none"> • <i>K. varians</i> • <i>Staph. carnosus</i> • <i>Lb. curvatus</i> • <i>Staph. xylosus</i> 	<ul style="list-style-type: none"> – For all types of sliceable and spreadable raw sausages requiring safe protection against listeria and mild acidification – Protective strain: <i>Lb. curvatus</i> 	<ul style="list-style-type: none"> 25 g (for 100 kg) 50 g (for 200 kg)
44.00254	M-CULTURE® Safe 2100	<ul style="list-style-type: none"> • <i>Staph. xylosus</i> • <i>Staph. carnosus</i> • <i>Lc. lactis</i> • <i>Lb. plantarum</i> 	<ul style="list-style-type: none"> – For all types of sliceable and spreadable raw sausages requiring safe protection against listeria and mild acidification – Protective strain: <i>Lb. plantarum</i> 	20 g (for 100 kg)
44.00374	M-CULTURE® Safe 3100 SSL	<ul style="list-style-type: none"> • <i>Lb. curvatus</i> • <i>Lb. plantarum</i> • <i>Lc. lactis</i> • <i>Staph. carnosus</i> • <i>Staph. xylosus</i> • <i>K. varians</i> 	<ul style="list-style-type: none"> - for all sliceable raw sausage types that require a reliable protection against listeria and mild acidification - rapid reddening, best color stability and extended fat stability - protective cultures: <i>Lb. plantarum</i>, <i>Lb. curvatus</i> 	20 g (for 100 kg)
44.00369	M-CULTURE® 5100 TZM	<ul style="list-style-type: none"> • <i>Lb. plantarum</i> • <i>Lc. lactis</i> • <i>Staph. xylosus</i> 	– for Zwiebelmettwurst and comparable products that require reliable protection against listeria	50 g (for 100 kg)

Acidification curves of some M FOOD GROUP® protective cultures:





M-CULTURE® VEGAN

PROTECTIVE CULTURE FOR VEGAN & VEGETARIAN FOOD

Plant protein-based vegan food products have become a huge trend over recent years. Keeping these products flavourful and fresh for a long time is an important challenge for many manufacturers. Gas-producing micro-organisms and undesirable lactic acid bacteria often present a problem for fresh, plant-based foods.

We have the solution for protecting your vegan food products: M-CULTURE® Safe Vegan.

The new protective culture has a positive effect on the product microflora, thus offering effective protection. Thanks to its unique microbiological and enzymatic properties, the culture ensures that the product stays fresh for a long time. It also reduces the unpleasant bean-like off-flavour of pea protein-based products.



M-CULTURE® SAFE VEGAN:



...protects pea protein-based vegan food products



...is substrate specific



...is ideal for non-fermented, fresh products



...has a positive effect on the product microflora



...enhances sensory properties



...is classified as a foodstuff ingredient



...is biological



Art.-No.	Name	Composition	Application	Packaging
43.11005	M-CULTURE® Safe Vegan	• <i>L. carnosum</i>	<ul style="list-style-type: none"> – Special protection for all fresh vegan pea-based meat substitutes due to displacement effect – Gives freshness to the product and reduces the typical bean taste 	20 g (for 100 kg)
43.11010	M-CULTURE® plant LEG MA	• <i>Lb. plantarum</i>	<ul style="list-style-type: none"> – For fermented plant-based products (e.g. vegan raw sausages) – Preferred for use in pea-based products – Off flavor reduction – Slight to strong acid formation depending on temperature control 	20 g (for 100 kg)



ISI test report – vegan mince; Challenge study with *Leuconostoc carnosum*: Pea protein-based vegan mince
Dr. Dieter Elsser-Gravesen, ISI FOOD PROTECTION ApS, Aarhus, Denmark



CULTURES TASTE TECHNOLOGY®
MADE IN GERMANY



M-ProTec®
Protect your food



**DOWNLOAD
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