CHR. HANSEN

Improving food & health

Cheese Culture Catalogue

DVS® Product Range

2014

DVS® Benefits

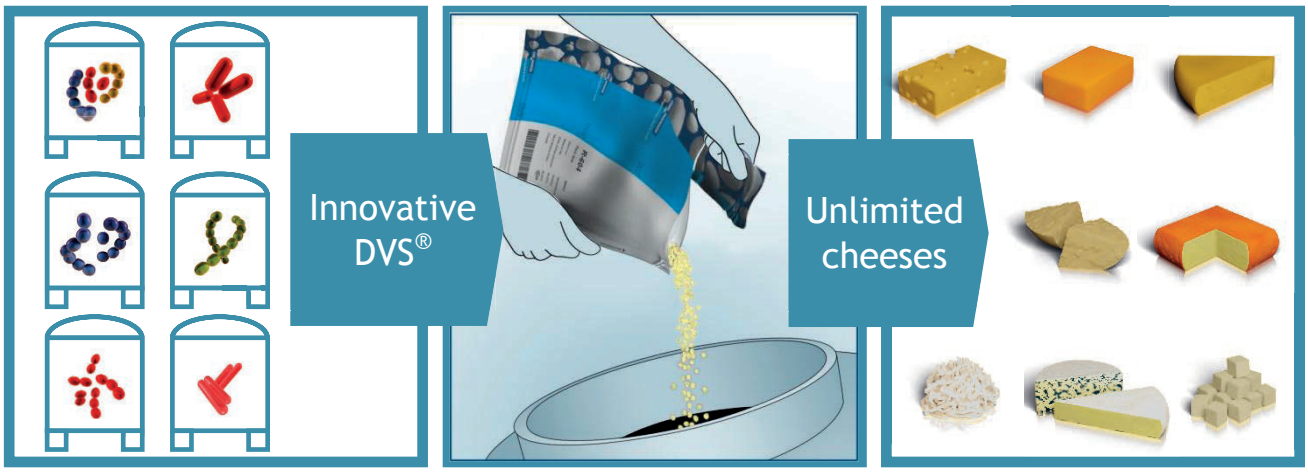
- Yield Plus™
- Risk Minus™
- Growth Multiply™
- Process Convenience
- Chr. Hansen Expertise & Competencies

Imagine a world of opportunities just waiting to be grasped

To all of those who are fearful that Chr. Hansen DVS® cheese cultures mean standardization, banality and leveling-down, this catalogue should bring some comfort. Chr. Hansen has the broadest, most extensive culture range in the dairy world and combines tradition, innovation, loyalty and change - imagine where we could go together.

A winning culture for all types
Since the 1970's – when Chr. Hansen invented highly concentrated and standardized cheese cultures as for example the Direct Vat Set (DVS®) – we have focused on reliability and quality at the forefront of market trends. Chr. Hansen provides today's dairy industry with a full pallet of Cultures & Enzymes solutions. This is delivered together with application know-how, service and inspiration.

Do you know how many cheeses there are?
We do not know – but there are probably several thousands. In order to simplify the navigation in this complex cheese world, we have classified our culture series and defined eight groups of cheese "families" as well as more specialized cultures. Together, these segments form the backbone of this catalogue.



Value-creating innovation and local support
Today, our most valuable commodity is know-how within application and process control. We have more than 20 application centers around the world providing you with the opportunity to carry out trials with new and existing Chr. Hansen products, in a production environment similar to your facilities at home.

For further information, please contact your local sales representative or visit us at www.chr-hansen.com

Table of Content

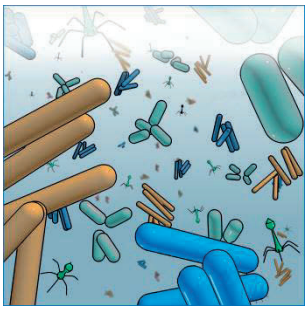
DVS® & EASY-SET® Benefits

Yield Plus™

- Your booster to get more value – you can focus on optimizing yield without worrying about the consistency of your cheese quality
- Capture high-value niche opportunities or extracting the value from whey
- No added investments in infrastructure required

Risk Minus™

- Your insurance policy to secure consistent delivery
- Phage management and backup solutions – Robustness to Phages
- Expand internationally or maybe consolidate plants – minimizing risk



Growth Multiply™

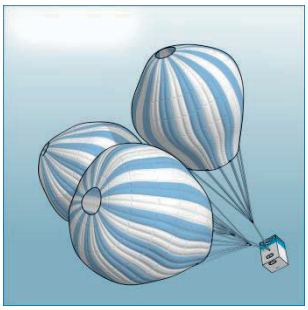
- Your kick-starter to innovation and new business opportunities e.g. products and processes
- Proven capabilities and innovative methods focusing on customer needs
- Full pallet of culture solutions and ability to customize

Process convenience

- Easy to use: No preparation
- Easy to transport
- Flexibility in production planning (and cycle)

Chr Hansen Expertise & Competencies

- Global network and active knowledge sharing
- Global supply and presence
- Value creating innovation



Cultures for all Cheese Segments

To simplify the process of identifying the best Chr. Hansen *culture series* to the *cheese type* being produced, this brochure is divided into eight main segments of "cheese families". The table below provides an overview of the different DVS® culture series that are available.

Cheese Segment	Cheese types	Chr. Hansen DVS®
	*Cheddar, Monterey Jack, Colby, Territorials, American Cheddar and other types with no eyes and strong acidification.*	*DVS® R* *DVS® RST* *DVS® RSF*
	*Semi-hard cheese types with small to medium size holes like: Gouda, Edam, Danbo, Samsø, Havarti, Saint Paulin, Raclette, Manchego, Prato etc.*	*DVS® Flora Danica* *DVS® CH-N* *DVS® DCC* *EASY-SET® FLORA™* *DVS® R*
	*Mozzarella, Pizza Cheese, Provolone and Kashkaval.*	*DVS® STI* *DVS® TCC*
	*Cottage Cheese types*	*Fresco®* *DVS® CC* *DVS® R*
	*Emmental, Gruyére, Maasdam*	*DVS® CH-N* *DVS® DCC* *DVS® STEM* *DVS® PS* *DVS® LH*
	*Camembert, Brie, Gorgonzola, Crezenza, Argentine Port Salut*	*DVS® CH-N/FLORA* *DVS® Mild O* *DVS® SDMB* *DVS® ST-B/SSC* *DVS® CZ* *DVS® BA*
	*Grana, Parmasan, Sbrinz, Pecorino*	*DVS® Grana* *DVS® MLC* *DVS® TCC*
	*Feta and White brined cheeses*	*DVS® SafeIT* *DVS® FRC* *DVS® Mild O* *DVS® R*

Cultures for Special Purposes

In addition to the eight cheese “families”, the culture cheese range also contains culture types – *Ripening, Protective cultures, Kosher For Passover and Butter* - which are used widely across many of the cheese segments for unique flavor development, extended shelf life etc.

Culture types	Cheese types	Chr. Hansen culture series
	*Various cheese types when special flavor development during the ripening time is desired. Also certain mold and rind ripened cheese types.*	***Flavor development:*** *DVS® CR* *DVS® PS* *DVS® LH* *DVS® EMFOUR* *DVS®* CR-*Full Flavor* ***Molds, Yeast, and Brevibacterium:*** *SWING® SALSA, PC, PR/PRG, GEO, LAF, BL/BC*
	*Various cheese types when special shelf life properties are desired.*	*DVS® FreshQ®* DVS® *BioSafe™*
	*Various cheese types when the Kosher For Passover certification is required.* *All Chr. Hansen cheese cultures are Kosher certified. These cultures also covers the special period of Kosher for Passover*	*KFP™*
	*Various butter and spread types both traditional and continuous processed*	*DVS® D-series*

Types of Microorganisms in Cheese Cultures

Culture Type	Name	Characteristics
 O	*Lactococcus lactis* subsp. *cremoris* *Lactococcus lactis* subsp. *lactis*	*Mesophilic* *Homofermentative* *Flavor contribution*
 L	*Leuconostoc* sp.	*Mesophilic* *Heterofermentative* *Gas production*
 D	*Lactococcus lactis* subsp. *lactis biovar diacetylactis*	*Mesophilic* *Homofermentative* *Flavor contribution* *Gas production from citrate*
 LD	*Lactococcus lactis* subsp. *cremoris* *Lactococcus lactis* subsp. *lactis* *Leuconstoc* sp. *Lactococcus lactis* subsp. *lactis biovar diacetylactis*	*Mesophilic* *Heterofermentative* *Flavor contribution* *Gas production*
 ST	*Streptococcus thermophilus*	*Thermophilic* *Homofermentative*
 LbH	*Lactobacillus helveticus*	*Thermophilic* *Homofermentative* *Flavor contribution*
 LbB	*Lactobacillus delbrueckii* subsp. *bulgaricus*	*Thermophilic* *Homofermentative* *Flavor contribution*
 LbP	*Lactobacillus paracasei*	*Mesophilic* *Fac. Heterofermentative* *Flavor contribution*
 LbL	*Lactobacillus delbrueckii* subsp. *lactis*	*Thermophilic* *Homofermentative* *Flavor contribution*
 Lb rh	*Lactobacillus rhamnosus*	*Thermophilic* *Fac. Heterofermentative* *Flavor contribution*
 Lb cu	*Lactobacillus curvatus*	*Mesophilic* *Fac. Heterofermentative* *Flavor contribution*

Culture Type	Name	Characteristics
 **Lb pl**	*Lactobacillus plantarum*	*Mesophilic* *Fac. Heterofermentative* *Flavor contribution*
 **Lb jo**	*Lactobacillus johnsonii*	*Thermophilic* *Homofermentative* *Flavor contribution*
 **P ac**	*Pediococcus acidilactici*	*Thermophilic* *Homofermentative* *Flavor contribution*
 **PC**	*Penicillium candidum*	*Surface yeast* *Flavor contribution* *White to grayish color tones*
 **PR**	*Penicillium roqueforti*	*Core yeast* *Flavor contribution* *Green to bluish color tones*
 **GEO**	*Geotrichum candidum*	*Surface yeast* *Flavor contribution*
 **LAF**	*Yeast*	*Surface yeast* *Flavor contribution* *pH neutralizing and/or fermenting properties*
 **SALSA**	*Staphylococcus xylosus*	*Flavor contribution*
 **BL**	*Brevibacterium*	*Smearing bacteria* *Flavor contribution* *Surface coating* *Orange color tones*
 **PAB**	*Propionibacterium*	*Thermophilic* *Heterofermentative* *High gas production*

The Magic of Cultures

Definitions of Culture Performance Rating

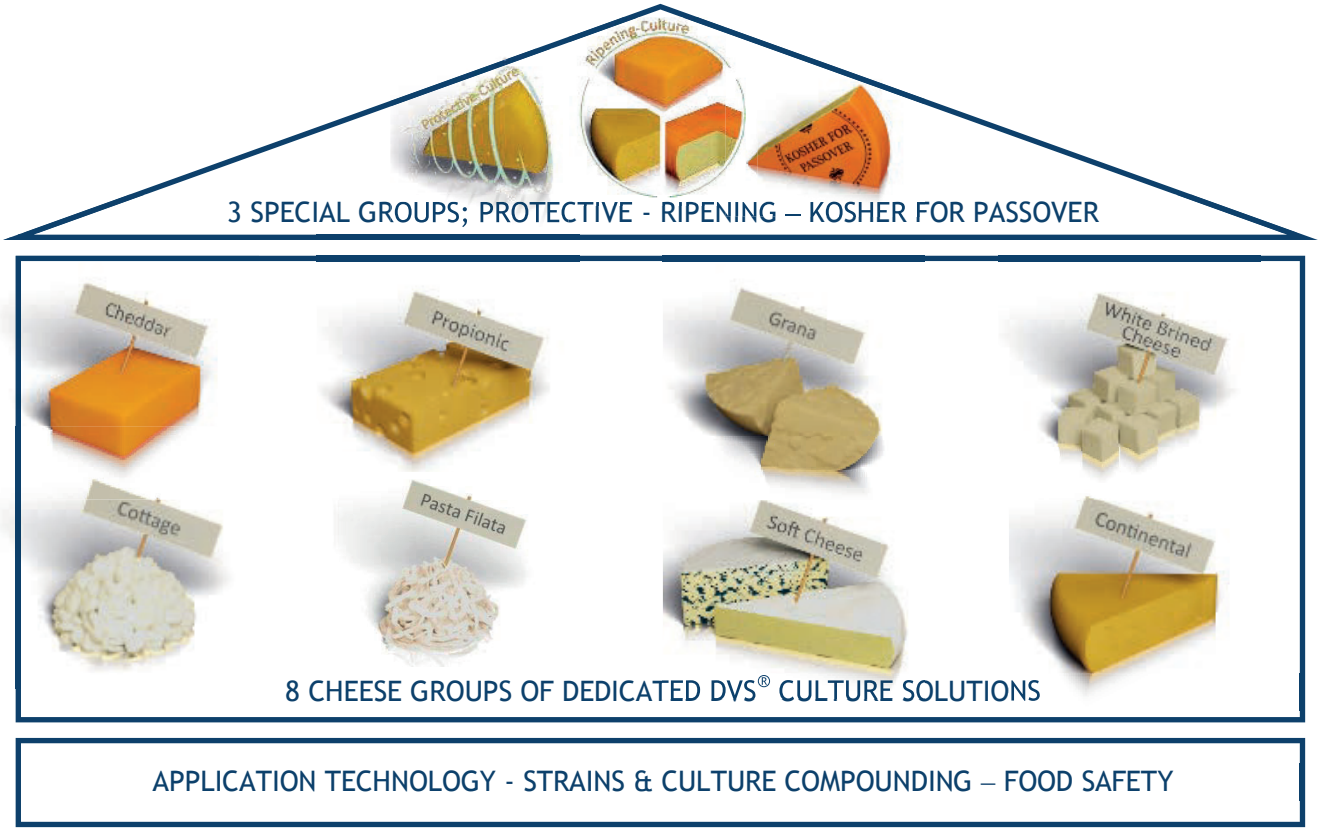
The cultures in this catalogue are classified by their performance and functionality for: *Acidification speed*, *Phage robustness, Contribution to flavor*, and when relevant also *Gas production*. The scale is a 5-level scale from low/slow to high/fast. As an example the below DCC series is rated for acidification speed (very fast), phage robustness (very robust), flavor (a real flavor maker) and also gas producing (giving many eyes in the cheese) - all indicated with black boxes for score. For example:

DVS® DCC

	Low	High
Acidification speed:	■ ■ ■ ■ □	
Phage robustness:	■ ■ ■ ■ ■	
Contribution to flavor:	■ ■ ■ ■ ■	
Gas production:	■ ■ ■ ■ □	

Design of cultures

Chr. Hansen's sophisticated design technologies secure optimization of cultures, ensuring superior performance, phage robustness and quality of the final cheese. This catalogue highlights how we have constructed our cultures to maximize cheese manufacturer and consumer benefits. As illustrated in this catalogue, individual strains of bacteria are compounded together into high value cultures, allowing the manufacturer to produce almost unlimited types of cheese.



Mesophilic aromatic cultures

LD cultures are the classical aromatic starters containing all four species of mesophilic lactic acid bacteria:

- *Lactococcus lactis* subsp. *lactis* (O)
- *Lactococcus lactis* subsp. *cremoris* (O)
- *Leuconostoc mesenteroides* subsp. *cremoris* (L)
- *Lactococcus lactis* subsp. *lactis* biovar *diacetylactis* (D)

LD cultures are mixtures of the culture components O, L, and D in various ratios. The term LD culture indicates the presence of the two aroma-forming bacteria, *Leuconostoc and L. diacetylactis,* which are characterized by their ability to produce aroma and gas by converting the citrate in milk into the flavor compound diacetyl and CO_2.

LD cultures are widely used in the production of soft cheeses like traditional Camembert and in continental cheeses with round eyes e.g. Gouda cheese. When producing the continental cheese types, one of the quality features is the right holes or "eye" formation. The size and the number of eyes in the cheese are some of the most difficult things to control. To a certain degree this eye formation is dependent on the rate of citrate fermentation in the cheese (measured as mg of citrate fermented after 24 hours). The composition between acid producing strains and aroma-forming strains as well as the ratio between *L. cremoris* and *L. diacetylactis,* can be related to the rate of metabolism of citrate. However, many non-culture related factors are also involved e.g. production process, temperature, salt content, etc. The best known Chr. Hansen mesophilic aromatic cultures are the CH-N, Flora Danica, DCC and EASY-SET® FLORA series.

L cultures and D cultures, which only consist of either *Leuconostoc* or *L. diacetylactis* as the aroma-forming bacteria, are only used in cheese production to a limited extent. This is due to the traditional use of LD cultures in continental cheese production. Recent developments with Chr. Hansen has created a new Edam EASY-SET® FLORA C100 and C900 range which is a L culture blend of both L and O components, ideal for Edam manufacturing and other cheese types when a cheese with small eyes and traditional cheese flavour is desired.

Mesophilic homofermentative cultures – O culture

O cultures only consist of the acid-producing strains, *Lactococcus lactis* subsp. *lactis/cremoris*. This type of culture is mainly used in Cheddar, Cottage Cheese, White Brined Cheese (Feta) and other cheese types in which a gas formation in the product is undesirable. The best known Chr. Hansen mesophilic homofermentative cultures are the R, FRC, and Mild O series.

To improve the acidification activity of the O-type cultures for Cheddar and other fast cheese productions, a very fast series of cultures have been developed by blending mesophilic homofermentative cultures with *S. thermophilus.* During a typical Cheddar production the O culture will initiate the acidification during renneting at 30-32°C (86-90°F). However, due to the thermophilic nature of the *S. thermophilus* culture, this culture will take over the acidification during the scalding step at 37-40°C (98-104°F), and continue on the belt during the cheddaring process allowing the manufacturer to reach target pH quickly.

Thermophilic cultures – ST culture - are mainly used in cheese in which either

- a scalding temperature 40-54°C (104-130°F) is used e.g. in hard cheese like Emmenthaler, Gruyere and Grana, *or*
- a high scalding temperature during cheese make is used, e.g. 37°C (98°F), as in the soft cheese types like Cresenza and stabilised Brie types, or in the Pasta filata types like Mozzeralla and Pizza cheese.

For Emmenthaler and Gruyere types of cheeses, *S. thermophilus* and *L. helveticus* are normally used. *L. helveticus* is able to ferment the galactose which is secreted by the *S. thermophilus,* and processes a high proteolytic activity, giving the required proteolysis and desired flavor.

In production of Pasta filata types of cheese as well as different US style pizza cheeses, *S. thermophilus* is used as the main culture - sometimes in a blend with either *L. bulgaricus* or *L. helveticus* to obtain the right characteristics of the cheese. For production of Pasta Filata it is important to have a very fast acidifying and phage resistant culture. Examples of Chr. Hansen cultures for this application are STI, TCC, and TCC-20.

Propionic acid bacteria may not be classified as real lactic acid bacteria, but they are used in the production of certain cheeses (Emmenthaler, Swiss, Maasdam, etc.), in which large eyes and sweet nutty flavors are desirable. Examples of Chr. Hansen cultures for this application are the PS series.

Flavor Control™ cultures are regarded as a "package" of bacteria added as adjunct cultures, containing the right enzymes to modify the ripening process incl. foil ripening/rindless cheese. During ripening the additional bacteria added will lyses, releasing the intracellular enzymes into the cheese matrix and in this way modify the ripening process. Examples of Chr. Hansen cultures are CR-200, CR-300, and CR Full Flavor series.

SWING® cultures are a range of aerobic cultures which can be divided into four main categories: Mold, Yeast, Brevibacterium and others. Due to the aerobic nature of the SWING® cultures, they mainly grow on the surface of cheese.

The SWING® Mold cultures are mainly used in the production of white mold cheeses like Brie, Camembert and blue mold cheeses like Gorgonzola. The two most important types of mold are the white mold *Penicillium candidum* and the blue mold *Penicillium roqueforti*. **SWING® Yeast** is often used to stimulate the growth of other microorganisms as Brevibacterium on the cheese surface, due to their ability to increase pH by fermenting lactic acid.

SWING® Brevibacterium (or the so-called "smear cultures") are traditionally smeared on the surface of cheese just after brining. Brevibacterium are very salt tolerant and have a strong proteolytic activity. During growth on the cheese surface, *Brevibacterium linens* creates a characteristic orange color and smear layer. Due to the high protein degradation on the cheese surface, flavor compounds penetrate into the centre of the cheese and give the characteristic ripened flavor of smear cheeses.

We are pleased to present this overview of our cultures where innovation and responsiveness to market go hand in hand.

Distinguishing Characteristics of Lactic Acid Bacteria

Schematic illustration									
Organism		***Streptococcs thermophilus***	***Lactococcus lactis* subsp. *cremoris***	***Lactococcus lactis* subsp. *lactis***	***Lactococcus lactis subsp. Lactis biovar diacetylactis***	***Leuconostoc* sp.**	***Lactobacillus helveticus***	***Lactobacillus delbrueckii* subsp. *bulgaricus***	***Lactobacillus delbrueckii* subsp. *Lactis***
Shape		*Cocci*	*Cocci*	*Cocci*	*Cocci*	*Cocci*	*Rod*	*Rod*	*Rod*
Isomer of Lactate		*L*	*L*	*L*	*L*	*D*	*DL*	*D*	*D*
% Lactic Acid Produced in Milk		*0.6*	*0.8*	*0.8*	*0.8*	*< 0.5*	*2.0*	*1.8*	*1.8*
Metabolism of Citrate (Flavor)		-	-	-	+	+	-	-	-
Growth at	10°C (50°F)	-	+	+	+	+	-	-	-
	40°C (104°F)	+	-	+	+	-	+	+	+
	45°C (113°F)	+	-	-	-	-	+	+	+
Fermentation of	Glucose	+	+	+	+	+	+	+	+
	Galactose	-	+	+	+	+	+	-	+/-
	Lactose	+	+	+	+	+	+	+	+

Information on Direct Vat Set/DVS®

DESCRIPTION
DVS® is a highly concentrated and standardized frozen or freeze-dried dairy culture, used for direct inoculation of milk. DVS® cultures need no activation or other treatment prior to use.

APPEARANCE
Frozen DVS® cultures are water-soluble pellets, approximately 5 mm in diameter, with an off-white to brownish color. The pellets have a slight peptone-like odor. Freeze-dried DVS® cultures are water-soluble granules, 2-8 mm in diameter, with an off-white to slightly red or brown color. The granules have a slight peptone-like odor.

TECHNICAL DATA
Chr. Hansen's DVS® cultures rely only on lactic acid bacteria, internationally approved for the dairy industry. Our cultures are all of natural origin and are produced using the latest production technology.

PURITY
Chr. Hansen's DVS® cultures comply with IDF 149 (International Dairy Federation) / ISO 27205:2010 standards, regarding maximum contaminant content.

	Frozen DVS®	**Freeze-dried DVS®**
Non lactic acid bacteria	< 500 cfu/g	< 500 cfu/g
Yeasts and molds	< 1 cfu/g	< 10 cfu/g
Enterobacteriaceae	< 1 cfu/g	< 10 cfu/g
Coagulase-positive staphylococci	< 1 cfu/g	< 10 cfu/g
Salmonella spp.*	absent in 25g	absent in 25g
Listeria monocytogenes*	absent in 25g	absent in 25g

** analyzed on a regular basis*

STORAGE AND STABILITY
Frozen DVS® cultures should be stored at -45°C (-49°F) or below. If frozen DVS® cultures are stored correctly, the shelf life is at least 12 months.

Freeze-dried DVS® cultures should be stored at -18°C (0°F) or below. If freeze-dried cultures are stored correctly, the shelf life is at least 24 months. At +5°C (41°F) the shelf life is at least 6 weeks.

PACKAGING
Frozen DVS® cultures, as a standard, come in 10 x 500 unit disposable plastic bags co-packed in a cardboard box. For shipping, the boxes are packed in a special plastic foam box with dry ice. For certain products, other packaging sizes than 10 x 500 units are available.

Freeze-dried DVS® cultures are supplied in alufoil pouches and are available in the following standard sizes:

50 unit pouch - 10 pouches per box
200 unit pouch - 25 pouches per box
500 unit pouch - 20 pouches per box

SHIPMENT TERMS
For frozen DVS® cultures, the total shipment time from Chr. Hansen to the customer should not exceed 72 hours. Freeze-dried DVS® cultures may be transported at room temperature for up to ten days, without the quality of the cultures being affected.

APPLICATION
DVS® for regular cheese milk
The cheese milk is inoculated with the culture in the cheese vat or tank. The cheese milk may require 20-40 minutes of pre-ripening before applying rennet. However, normal cheese-making procedures and time limits can be obtained by adding appropriate amounts of $CaCl_2$ to the cheese milk.

DVS® for UF concentrated milk
Frozen DVS® cultures allow fermentation of UF concentrated milk, without dilution of the concentrate.

DOSAGE
Recommended standard inoculation rates are given below. However, specific usage rates should be determined experimentally prior to any new application.

Application	**Frozen DVS®**	**Freeze-dried DVS®**
Cheese	50-150 units per 1000 L	50-150 units per 1000 L

GUARANTEE
Chr. Hansen's dairy cultures are produced in conformity, with the regulations of the local health authorities.

TECHNICAL SERVICE
Chr. Hansen has internationally dispersed development centers, as well as application centers in all major dairy markets. For specific application advice and support, please contact your local Chr. Hansen representative or visit us at www. chr-hansen.com.

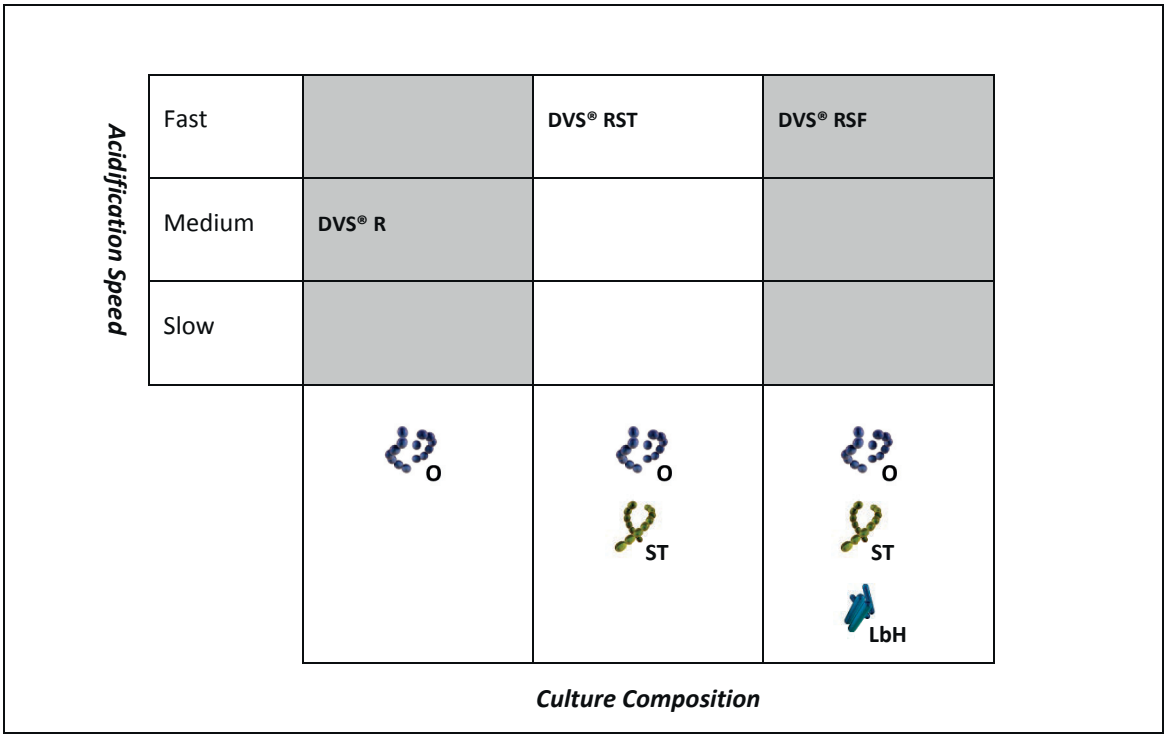
CULTURE PERFORMANCE IN THIS CATALOGUE
All the cheese culture series, as well as individual cultures, are rated on a scale from 1 - 5 for ***Acidification speed***, ***Phage robustness, Contribution to flavor***, and when relevant also for ***Gas production***. 1 is low and 5 is high. The rating of a culture series is based on the average performance of the individual cultures in the series. This means that the score of the individual cultures will sometimes vary slightly from the rating of the series. Some culture series in this catalogue are described under several different cheese segments. The rating can be different for the same series since the typical culture application may vary from segment to segment.

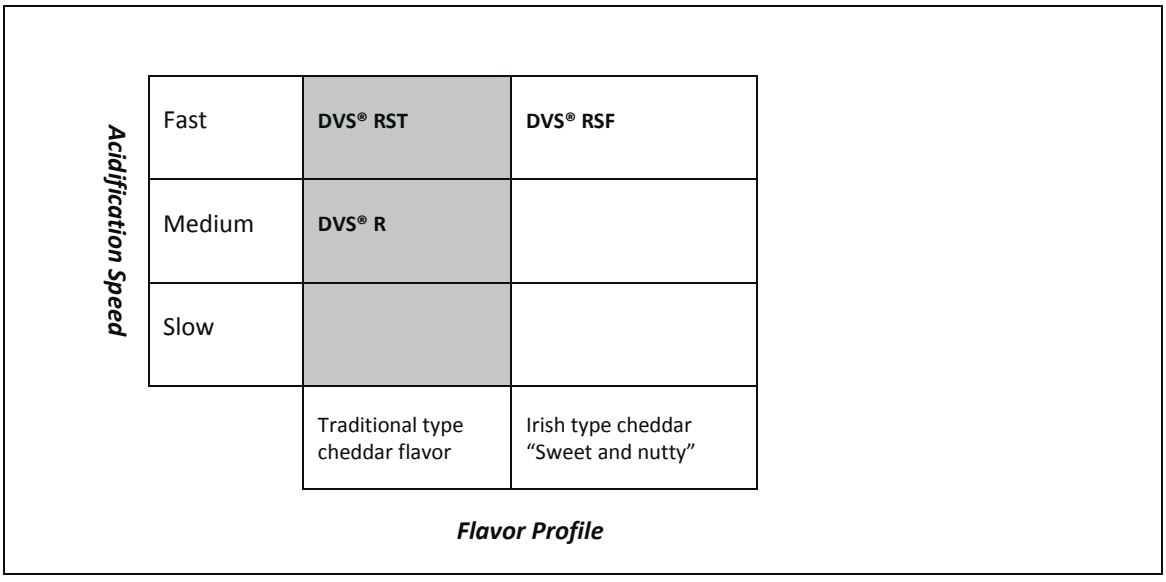
Example of how the DCC series from the continental segment is rated:

	Low				High
Acidification speed:	■	■	■	■	□
Phage robustness:	■	■	■	■	■
Contribution to flavor:	■	■	■	■	■
Gas production:	■	■	■	■	□

Introduction to Cheddar Cheese Cultures

The figure below provides an overview of the different culture series that belong to the Cheddar cheese "family". The cultures vary significantly from each other as far as flavor contribution to the cheese and acidification speed. Generally, the cultures that are located in the far right of the figure will have high flavor contribution due to the presence of Lactobacillus strains.





DVS® R

One of the major reasons behind the success of Chr. Hansen is the R series solutions. The R series includes a full range of cultures for various cheese productions to fit the demands of the modern cheese producer. This mesophilic homofermentative culture range contains O strains known particularly for fast acidification and phage resistance which is acknowledge by cheese makers through many years and geographies. Within the R series, 03 and 04 are the most phage robust, whereas 07 and 08 are known for good savory flavor formation. Lastly, it is recommended to use this series in a culture rotation system.

Culture composition

O

Culture Performance

Acidification speed: ■ ■ ■ ■ □

Phage robustness: ■ ■ ■ ■ □

Contribution to flavor: ■ ■ □ □ □

Product Form

This series is available in both frozen and freeze-dried form in all standard packaging sizes.

Frozen

Storage: -45°C/-49°F

Freeze-dried

Storage: -18°C/0°F

DVS® RST

This series is a traditional homofermentative blend of mesophilic O culture strains and a thermophilic strain. The cultures in this series are known for their excellent phage robustness and fast acidification speed. This culture works best when the cheese process includes scalding temperatures at 37°C (99°F) or higher, which then typically will result in a faster cheese make time and also a more phage robust performance compared to all mesophilic blends. Additionally, it is recommended to use this series in a culture rotation system.

Culture composition

O

ST

Culture Performance

Acidification speed: ■ ■ ■ ■ ■

Phage robustness: ■ ■ ■ ■ ■

Contribution to flavor: ■ ■ □ □ □

Product Form

This series is available in both frozen and freeze-dried form in various packaging sizes.

Frozen

Storage: -45°C/-49°F

Freeze-dried

Storage: -18°C/0°F

DVS® RSF

This series is based on homofermentative cultures consisting of mesophilic O culture strains, a thermophilic strain and a *Lactobacillus helveticus* strain. The cultures in this series are known for their excellent phage robustness and fast acidification speed. Due to the presence of the *Lactobacillus helveticus* strain, the culture will add sweet and nutty flavor notes to the ripened cheese. For a more intense note of the sweet and nutty flavors, the RSF-621 culture is recommended due to the higher ratio of *Lactobacillus helveticus* strains than the other cultures in this series. Moreover, the RSF cultures work best when the cheese process includes scalding temperatures at 37°C (99°F) or higher, which then typically will result in a faster cheese make time and also a more phage robust performance compared to all mesophilic blends. Also it is recommended to use this series in a culture rotation system.

Culture composition

Culture Performance

Acidification speed: ■ ■ ■ ■ ■

Phage robustness: ■ ■ ■ ■ ■

Contribution to flavor: ■ ■ ■ ■ ■

Product Form

This series is available in both frozen and freeze-dried form in various packaging sizes.

Frozen

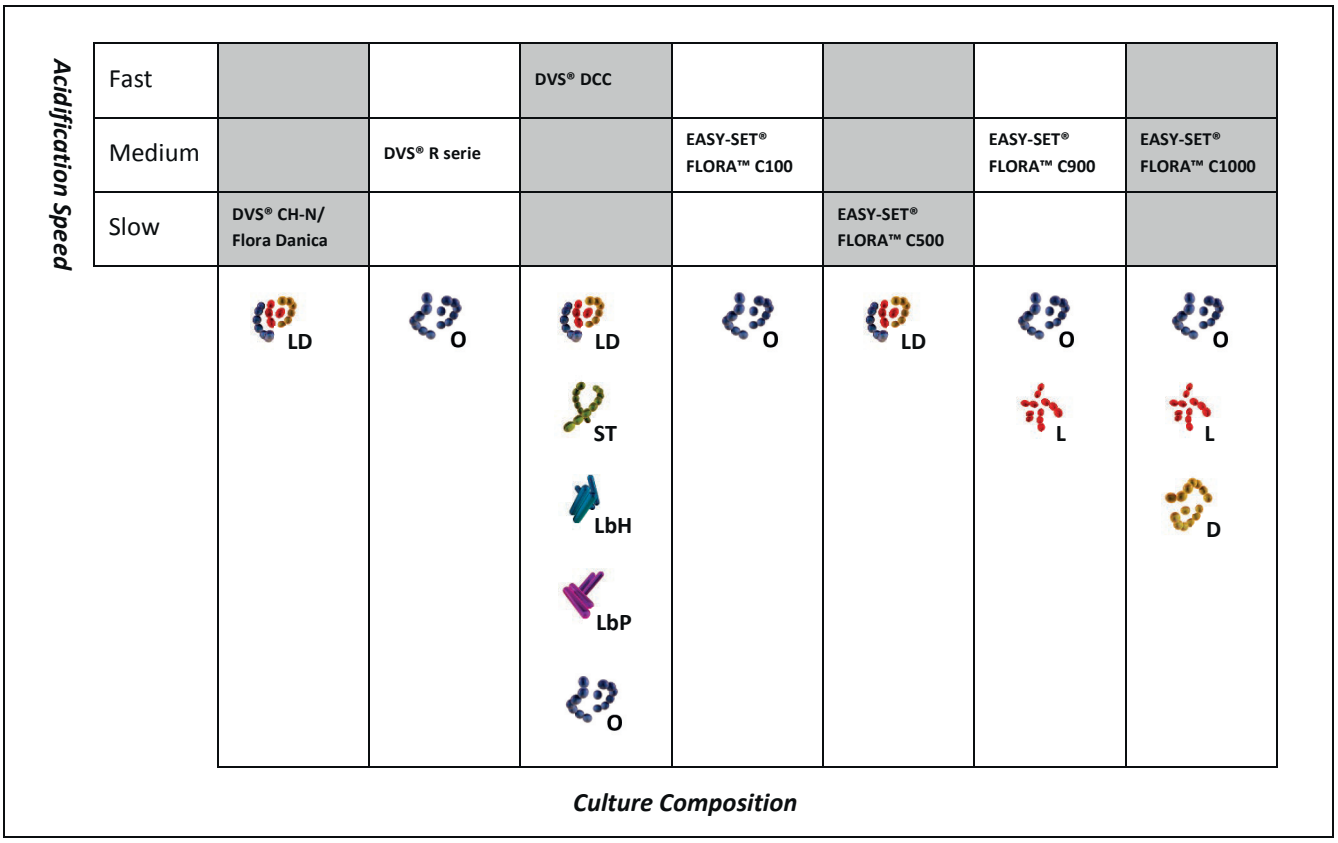
Storage: -45°C/-49°F

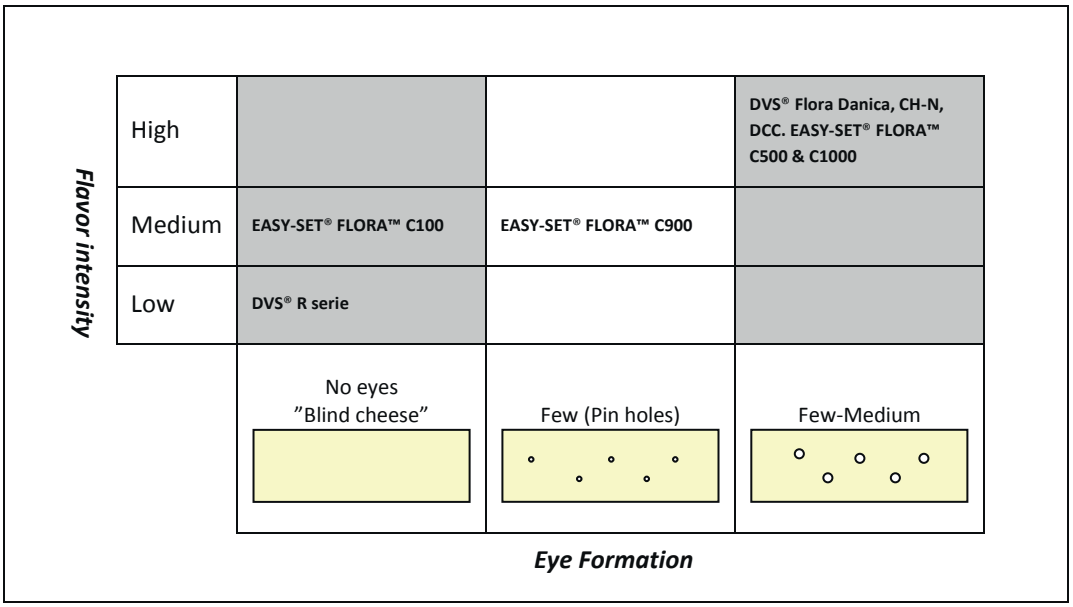
Freeze-dried

Storage: -18°C/0°F

Introduction to Continental Cheese Cultures

The continental cheeses are typified by semi-hard yellow cheeses as the Gouda and Edam types traditionally made in the Netherlands, but now produced worldwide for considerable international trade. Most important parameters are overall consistency of the finished cheese (acidification, flavor and texture), more control for the cheese maker and convenient to use. Culture types covers traditional DVS® LD cultures, but also blended cultures like DVS® DCC-type and the latest innovation of EASY-SET® FLORA™ C-series. A wide range of SWING® cultures for smear coat (*Brevibacterium linens)* and DVS® adjunct cultures for ripening or propionic cheeses can be used as a supplement and innovative cheeses or efficient ripening. The figure below provides an overview of the outstanding range of DVS® and EASY-SET® FLORA™ culture series that belong to the Continental cheese "family".





DVS® Flora Danica/CH-N

These series consist of several different traditional LD cultures that are all multiple defined blends of mesophilic strains. The cultures are citrate fermenting heterofermentative and will form eyes of various sizes in the finished cheese. The many different strains in the blend ensure extra good protection against bacteriophage. This series - and especially Flora Danica - is known for its exceptional “full flavor” that it provides to the finished continental cheese, whereas CH-N-19 is known for a very phage robust performance. Lastly, this culture series has optimum performance at scalding temperatures between 35-38°C (95-100 °F).

Culture composition

LD

Culture Performance

Acidification speed:	■ ■ □ □ □
Phage robustness:	■ ■ ■ ■ □
Contribution to flavor:	■ ■ ■ ■ ■
Gas production:	■ ■ ■ ■ ■

Product Form

This series is available in various frozen and freeze-dried packaging sizes.

Frozen

Storage: -45°C/-49°F

Freeze-dried

Storage: -18°C/0°F

DVS® DCC

This series consists of defined mixes of several different mesophilic and termophilus strains.

The DCC cultures are blends of LD, O, ST, LbH and LbP cultures. These blended cultures will increase the phage protection, enhance the rounded flavor and reduce the bitterness in the final cheese. The range is mainly used for scalding temperatures at 32-42°C.

Culture composition

Culture Performance

Acidification speed:	■ ■ ■ ■ □
Phage robustness:	■ ■ ■ ■ ■
Contribution to flavor:	■ ■ ■ ■ ■
Gas production:	■ ■ ■ ■ □

Product Form

This series is available in various frozen and freeze-dried packaging sizes.

Frozen

Storage: -45°C/-49°F

Freeze-dried

Storage: -18°C/0°F

DVS® R

This series is a traditional homofermentative culture consisting of 100% mesophilic O culture strains, known particularly for their phage-resistant properties. Within this series, R-03 and R-04 are the most phage robust, whereas R-07 and R-08 are known for good flavor formation. It is recommended to use this series in a culture rotation system.

Culture composition

Culture Performance

Acidification speed:	■ ■ ■ ■ □
Phage robustness:	■ ■ ■ ■ □
Contribution to flavor:	■ ■ □ □ □
Gas production:	□ □ □ □ □

Product Form

This series is available in both frozen and freeze-dried form in all standard packaging sizes.

Frozen

Storage: -45°C/-49°F

Freeze-dried

Storage: -18°C/0°F

EASY-SET® FLORA™ C100

This EASY-SET® FLORA™ C100 series is a blend of O cultures known for its high activity, suitableness at scalding temperatures up to 38°C (100°F) and good flavor contribution. The culture solution is very phage robust and of carefully selected mesophilic O culture strains. The culture is homofermentative and will not contribute to eye formation in the finished cheese, but it provides mild to medium mature flavor profile. EASY-SET® FLORA is a very phage robust series where only limited culture rotation is needed flowing the attitude “no rotation, but vacation/break”.

Culture composition

O

Culture Performance

Acidification speed:	■ ■ ■ ■ □
Phage robustness:	■ ■ ■ ■ ■
Contribution to flavor:	■ ■ □ □ □
Gas production:	□ □ □ □ □

Product Form

This series is available in frozen form.

Frozen

Storage: -45°C/-49°F

EASY-SET® FLORA™ C500

This EASY-SET® FLORA™ C500 series is a blend of traditional LD cultures known for providing an intense full flavor to the finished cheese. Within the continental range of cultures, this is considered a “slow to medium” speed culture, designed for cheese processes with five to six hours from culture addition to brine. Only pure mesophilic cultures are used in the C500 series and typical cheeses are Gouda, Edam, Maasdammer/ Leerdammer, St Paulin, Cantal, Tomme, Raclette, and local Swedish cheese types such as: Herrgårdsost, Grevéost, Prästost, Hushållost and local Danish types such as: Samsø, Havarti and Danbo.

Culture composition

LD

Culture Performance

Acidification speed:	■ ■ ■ □ □
Phage robustness:	■ ■ ■ ■ ■
Contribution to flavor:	■ ■ ■ ■ □
Gas production:	■ ■ ■ □ □

Product Form

This series is available in frozen form.

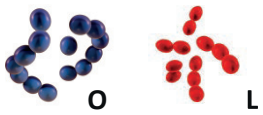
Frozen

Storage: -45°C/-49°F

EASY-SET® FLORA™ C900

This EASY-SET® FLORA™ series is a primary choice for fast cultures to main continental market. This EASY-SET® series is a blend of carefully selected O and L cultures known for fast acidification and production of cheese where only a limited eye formation is required. The FLORA™ C900 is designed for cheese processes with four to six hours from culture addition to brine and cheese with mild flavor profile. Within the continental range of cultures, the FLORA C900 series is designed for Edam, Gouda, Tilsiter, Butterkäse, Manchego or Raclette types of cheeses with relative mild flavor profile and few eyes. Additionally, the FLORA™ C900 is also attractive for Maasdammr/Leerdammen, Wilstermarch (Germany), St Paulin, Cantal, Tomme, Golandskiy, Kostromskoy and Rossiyskiy (Russia and Eastern Europe). EASY-SET® FLORA™ is a very phage robust series where only limited culture rotation is needed flowing the attitude “no rotation, but vacation/break”.

Culture composition



Culture Performance

Acidification speed:	■ ■ ■ ■ □
Phage robustness:	■ ■ ■ ■ ■
Contribution to flavor:	■ ■ ■ □ □
Gas production:	■ ■ □ □ □

Product Form

This series is available in frozen form.

Storage: -45°C/-49°F

EASY-SET® FLORA™ C1000

This EASY-SET® FLORA™ C1000 series is a blend of carefully selected L, D and O cultures known for providing an intense, full flavor, many eyes and smooth texture to the finished cheese. Within the continental range of cultures, this is considered a “slow to medium” speed culture, designed for cheese processes with five to six hours from culture addition to brine. Only pure mesophilic cultures are used in the EASY-SET® FLORA™ C1000 series and typical cheeses are Gouda, Edam and Maasdammer. EASY-SET® FLORA™ is a very phage robust series where only limited culture rotation is needed flowing the attitude “no rotation, but vacation/break”.

Culture composition

Culture Performance

Acidification speed:	■ ■ ■ □ □
Phage robustness:	■ ■ ■ ■ ■
Contribution to flavor:	■ ■ ■ ■ □
Gas production:	■ ■ ■ □ □

Product Form

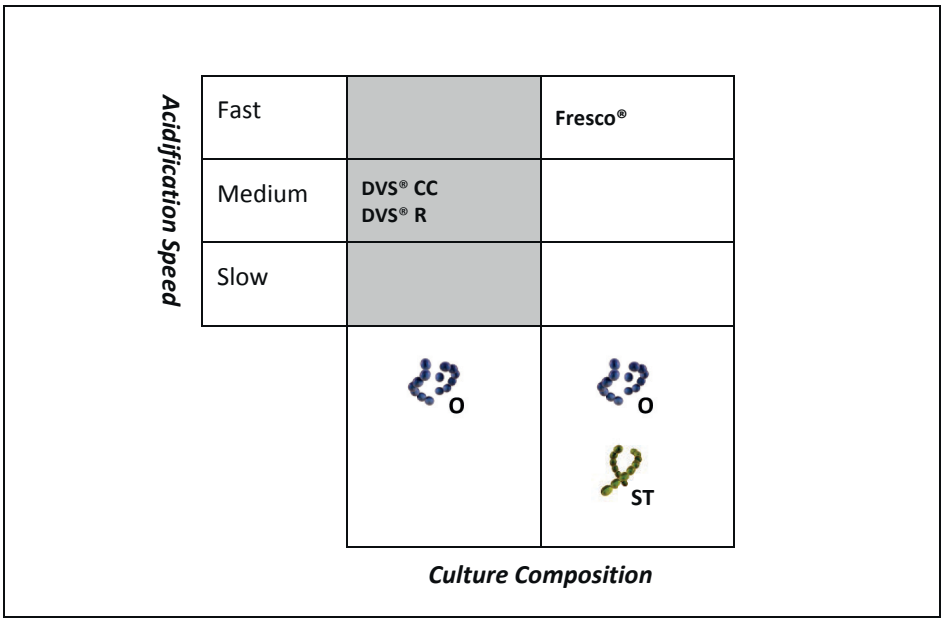
This series is available in frozen form.

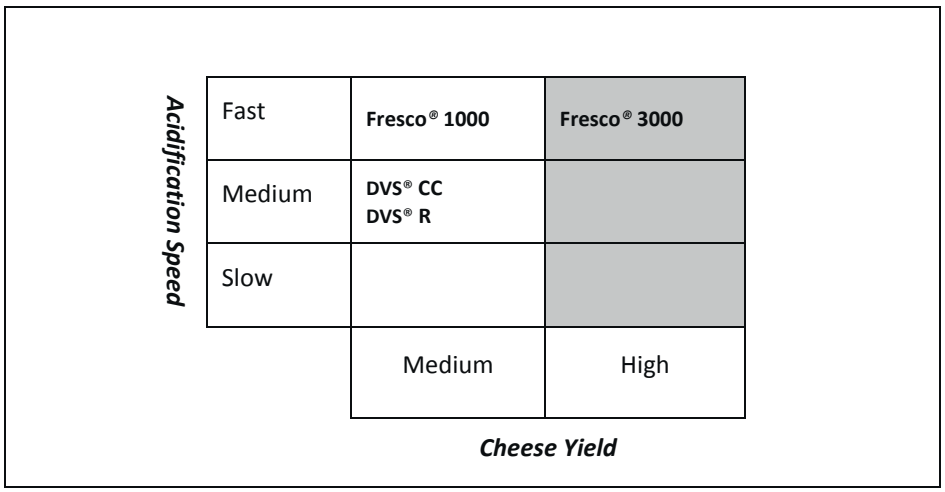
Frozen

Storage: -45°C/-49°F

Introduction to Cottage Cheese Cultures

The figure below provides an overview of the different culture series that belong to the Cottage cheese '"family". The cultures mainly differ from each other in cheese yield, acidification speed and phage robustness. Fresco® cultures are especially designed to meet strong performance requirement of cultures in the cottage cheese industry. These cultures contain special strains of *Lactococcus lactis* subsp. *lactis,* of *Lactococcus lactis* subsp. *cremoris,* and *Streptococcus thermophilus,* selected for their phage robustness, fast acid production, and particularly for Fresco® 3000 with excellent yield.





Fresco® 1000

Fresco® 1000 is a blend of mesophilic O culture strains and a thermophilic strain that is designed to meet requirements in the cottage cheese industry. Moreover, this series is known for very high phage robustness and fast acidification speed. The culture adds a nice clean fresh flavor to the cottage cheese with no bitterness. Lastly, it is recommended to use this series in a culture rotation system.

Culture Composition

Culture Performance

Acidification speed: ■ ■ ■ ■ ■

Phage robustness: ■ ■ ■ ■ ■

Contribution to flavor: ■ ■ □ □ □

Product Form

This series is available in frozen form in 1000 U packaging sizes.

Frozen

Storage: -45°C/-49°F

Fresco® 3000

This series is a blend of mesophilic O culture strains and a thermophilic strain that is designed to meet requirements in the cottage cheese industry. The series offers all the same advantages as the Fresco® 1000 like: Consistent set times and production procedures, increased plant throughput, and improved phage robustness. Innovation has taken Fresco® 3000 to the next level and now it also offers: A sophisticated way to increase cheese yield, and an improved curd identity and texture. Due to excellent water binding properties of some of the strains in the Fresco® 3000 range, a cottage cheese plant will typically see an improvement in cheese yield of 2-5%. This additional curd yield comes mostly from water that is bound in a sophisticated matrix, which ensures improvement of the curd quality and mouth feel. Lastly, it is recommended to use this series in a culture rotation system.

Culture composition

Culture Performance

Acidification speed: ■ ■ ■ ■ ■

Phage robustness: ■ ■ ■ ■ ■

Contribution to flavor: ■ ■ □ □ □

Product Form

This series is available in frozen form in 1000 U packaging sizes.

Frozen

Storage: -45°C/-49°F

DVS® CC

This series is a traditional homofermentative culture consisting of 100% mesophilic O culture strains, known particularly for their phage resistant properties. This series produces whey with very little residual galactose, providing excellent drying properties of the whey. Additionally, it is recommended to use this series in a culture rotation system.

Culture composition

O

Culture Performance

Acidification speed: ■ ■ ■ ■ □

Phage robustness: ■ ■ ■ ■ □

Contribution to flavor: ■ ■ □ □ □

Product Form

This series is available in frozen form in standard 500 U packaging sizes.

Frozen

Storage: -45°C/-49°F

DVS® R

One of the major reasons behind the success of Chr. Hansen is the R series solutions. The R series includes a full range of cultures for various cheese productions to fit the demands of the modern cheese producer. This mesophilic homofermentative culture range contains O strains known particularly for rapid acidification and phage resistance which is acknowledge by cheese makers through many years and geographies. Within the series, 03 and 04 are the most phage robust, whereas 07 and 08 are known for good savory flavor formation. Lastly, it is recommended to use this series in a culture rotation system.

Culture composition

O

Culture Performance

Acidification speed: ■ ■ ■ ■ □

Phage robustness: ■ ■ ■ ■ □

Contribution to flavor: ■ ■ □ □ □

Product Form

This series is available in both frozen and freeze-dried form in all standard packaging sizes.

Frozen

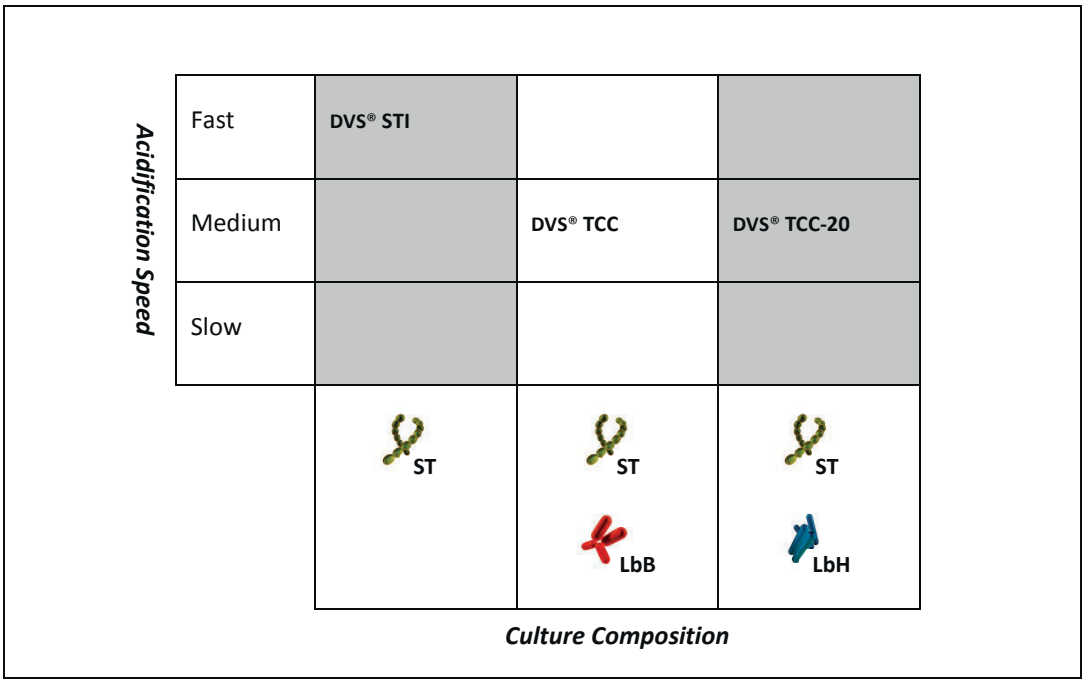
Storage: -45°C/-49°F

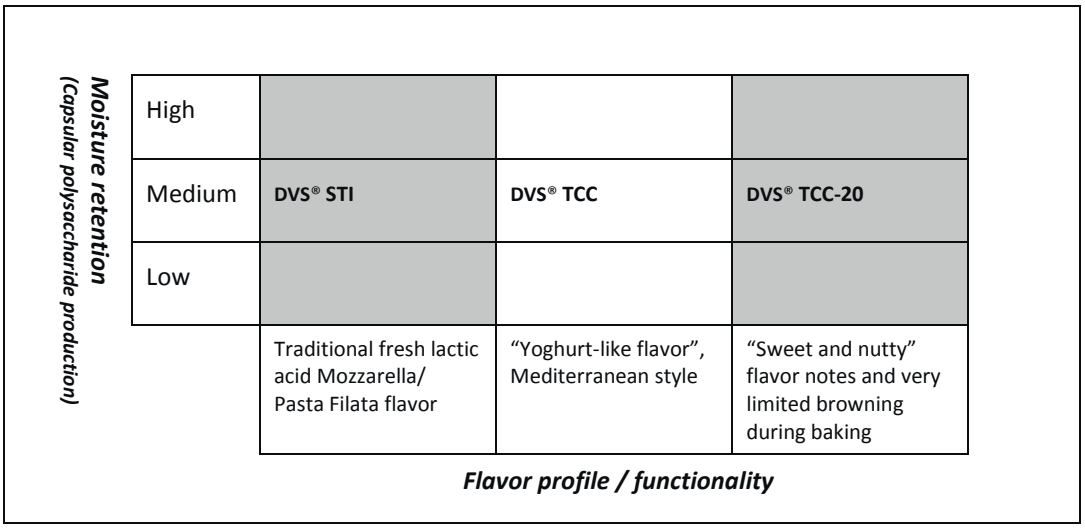
Freeze-dried

Storage: -18°C/0°F

Introduction to Pasta Filata Cheese Cultures

The figure below provides an overview of the many different culture series that belong to the Pasta Filata cheese "family". The cultures mainly differ from each other in acidification speed, flavor profile and phage robustness.





DVS® STI

This series is a complex blend of multiple-defined thermophilic strains that have been designed to provide the cheese plant with unique protection against bacteriophages, while achieving a very consistant and fast acidification. DVS® STI builds on state-of-the-art compounding technology and is known for mild flavour notes and a very fast acidification speed. Lastly, it is recommended to use this series in a culture rotation system.

Culture composition

ST

Culture Performance

Acidification speed: ■ ■ ■ ■ ■

Phage robustness: ■ ■ ■ ■ ■

Contribution to flavor: ■ ■ □ □ □

Product Form

This series is available in both frozen and freeze-dried form in various packaging sizes.

Frozen

Storage: -45°C/-49°F

Freeze-dried

Storage: -18°C/0°F

DVS® TCC

This series is a blend of thermophilic strains and *Lactobacillus bulgaricus,* providing the finished cheese with a traditional Mediterranean type of Pasta filata flavor. This culture should be used when yoghurt-like notes are desired in the finished Pasta filata cheese, and generally if increased flavor intensity is desired. Additionally, it is recommended to use this series in a culture rotation system.

Culture composition

ST

LbB

Culture Performance

Acidification speed: ■ ■ ■ □ □

Phage robustness: ■ ■ ■ ■ □

Contribution to flavor: ■ ■ ■ ■ □

Product Form

This series is available in freeze-dried form in some standard packaging sizes.

Freeze-dried

Storage: -18°C/0°F

DVS® TCC-20

TCC-20 is not a series, but a unique product which consists of a blend of *Streptococcus thermophilus* and *Lactobacillus helveticus* strains. The galactose level in the finished cheese is quite low for this particular culture, which makes the culture ideal for producing Pasta filata types of cheese with only limited browning during baking or heating.

Culture composition


ST


LbH

Culture Performance

Acidification speed: ■ ■ ■ □ □

Phage robustness: ■ ■ ■ ■ □

Contribution to flavor: ■ ■ ■ ■ ■

Product Form

This product is available in both frozen and freeze-dried form in various packaging sizes.

Frozen

Storage: -45°C/-49°F

Freeze-dried

Storage: -18°C/0°F

Introduction to Soft Cheese Cultures

The figure below provides an overview of the different culture series that belong to the Soft cheese "family". The cultures mainly differ from each other in acidification speed, flavor intensity, eye formation and water retention in the cheese.

Acidification Speed						
	Fast			**DVS® BA**		
	Medium			**DVS® CZ/ST-B/SSC**		**DVS® YF**
	Slow	**DVS® CH-N**	**DVS® SDMB**		**DVS® Mild O**	**DVS® STELLA**
		LD	D	ST	O	ST, LbB

Culture Composition

Flavor Intensity				
	High	**DVS® STELLA**		**DVS® Flora/CH-N**
	Medium	**DVS® Mild O**	**DVS® SDMB**	
	Low	**DVS® ST-B/SSC/CZ/BA/YF**		
		No eyes "Blind cheese"	Few (Pin holes)	Few-Medium

Eye Formation

DVS® Flora/CH-N

Flora and CH-N are unique set of solutions build on extensive field experience and designed by combining many mesophilic strains. This makes you able to fully capitalize on the value of consistency in cheese production. The cultures are heterofermentative and will form eyes of various sizes in the finished cheese. The many different strains in the cultures ensure good protection against bacteriophage. These series - and especially Flora Tradi and Flora Fresh – are known for the exceptional "full flavor" that they provide to the finished Soft cheese. Additionally, these culture series has optimum performance at scalding temperatures below 37°C (99°F).

Culture composition

LD

Culture Performance

Acidification speed:	■ ■ □ □ □
Phage robustness:	■ ■ ■ ■ ■
Contribution to flavor:	■ ■ ■ ■ ■
Gas production:	■ ■ ■ ■ ■

Product Form

This series is available in various frozen and freeze-dried packaging sizes.

Frozen

Storage: -45°C/-49°F

Freeze-dried

Storage: -18°C/0°F

DVS® Mild O

This series is a traditional homofermentative culture consisting of 100% mesophilic complex O culture strains. The culture is based on low proteolytic strains, resulting in very mild flavor notes with no bitterness in the finished cheese. It allows for a cheesy mesophilic flavor without getting holes or floating curds in the cheese vat. This culture is widely used for lactic curds like goat cheeses, and it can be used in blends with CH-N, D or STI series.

Culture composition

O

Culture Performance

Acidification speed:	■ ■ ■ □ □
Phage robustness:	■ ■ ■ ■ □
Contribution to flavor:	■ ■ ■ □ □

Product Form

This series is available in 500g frozen cartons and in a freeze-dried form.

Frozen

Storage: -45°C/-49°F

Freeze-dried

Storage: -18°C/0°F

DVS® SDMB

This series consists of several different cultures that are defined blends of *Lactococcus lactis spp. lactis biovar diacetylactis*. The cultures are homofermentative, but can form eyes in the finished cheese by fermentation of citrate. Moreover, the D cultures are known for flavoring properties, bringing fresh and creamy notes to the final cheese. The cultures have optimum performance at scalding temperatures between 35-38°C (95-100°F). Additionally, the cultures are usually blended together with LD, O or ST series and are seldom used alone.

Culture composition

D

Culture Performance

Acidification speed:	■ ■ □ □ □
Phage robustness:	■ ■ ■ ■ □
Contribution to flavor:	■ ■ ■ □ □
Gas production:	■ ■ ■ □ □

Product Form

This series is available in 500g frozen cartons.

Storage: -45°C/-49°F

DVS® ST-B / SSC

These series are based on thermophilic strains with a mild acidification. SSC-100, -102 and -103 are new robust cultures avoiding post-acidification. They bring clean taste and smooth mouth feeling. SSC-17 is a specific culture that stabilizes at a high pH value (about pH 5.2). SSC and STB can be used alone or in combination with CHN/Flora, R series or SDMB cultures according to the characteristics of the final cheese.

Culture composition

ST

Culture Performance

Acidification speed:	■ ■ ■ □ □
Phage robustness:	■ ■ ■ □ □
Contribution to flavor:	■ ■ □ □ □
Gas production:	□ □ □ □ □

Product Form

This series is available in various frozen and freeze-dried packaging sizes.

Frozen

Storage: -45°C/-49°F

Freeze-dried

Storage: -18°C/0°F

DVS® CZ

This series is based on thermophilic strains that initiate acidification fast and stabilize pH during storage. Moreover, the cultures are able to generate polysaccharides that retain water, which gives a smooth mouth feeling. Additionally, the cultures can be rotated and the main application is Italian Crescenza.

Culture composition

ST

Culture Performance

Acidification speed:	■ ■ ■ ■ □
Phage robustness:	■ ■ ■ ■ □
Contribution to flavor:	■ ■ □ □ □
Gas production:	□ □ □ □ □

Product Form

This series is available in various frozen 500g cartons.

Storage: -45°C/-49°F

DVS® BA

This series is based on thermophilic strains and associate very fast acidification speed with high texturing properties. The cultures are able to generate polysaccharides that retain water, which gives a smooth mouth feeling. The main application is Argentinean Port Salut type of cheese. It is recommended to use this series in a culture rotation system.

Culture composition

ST

Culture Performance

Acidification speed:	■ ■ ■ ■ ■
Phage robustness:	■ ■ ■ ■ □
Contribution to flavor:	■ ■ □ □ □
Gas production:	□ □ □ □ □

Product Form

This series is available in frozen form of 250 U pack sizes.

Frozen

Storage: -45°C/-49°F

DVS® YF

These series consist of blends of ST and *Lactobacillus bulgaricus* strains devoted to cheese acidification. The main applications are blue molded cheeses with specific requirements to the cheese body, e.g. a very smooth texture. Both series are known for a very “rounded“ flavor profile. Additionally, these cultures can be applied in Gorgonzola and Vacherin types of cheeses.

Culture composition

Culture Performance

Acidification speed:	■ ■ ■ ■ □
Phage robustness:	■ ■ ■ ■ □
Contribution to flavor:	■ ■ ■ □ □
Gas production:	□ □ □ □ □

Product Form

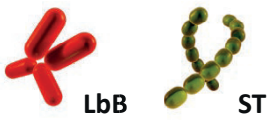
This series is available in frozen form.

Storage: -45°C/-49°F

DVS® STELLA

This unique culture of *Lactobacillus bulgaricus* enables a deep acidification during drainage and a high contribution in ripening due to its rich enzyme content. It is devoted to blue cheeses, e.g. Gorgonzola types, and Soft cheeses with very smooth texture in mouth and no bitterness.

Culture composition



Culture Performance

Acidification speed:	■ ■ □ □ □
Phage robustness:	■ ■ ■ ■ □
Contribution to flavor:	■ ■ ■ ■ □
Gas production:	□ □ □ □ □

Product Form

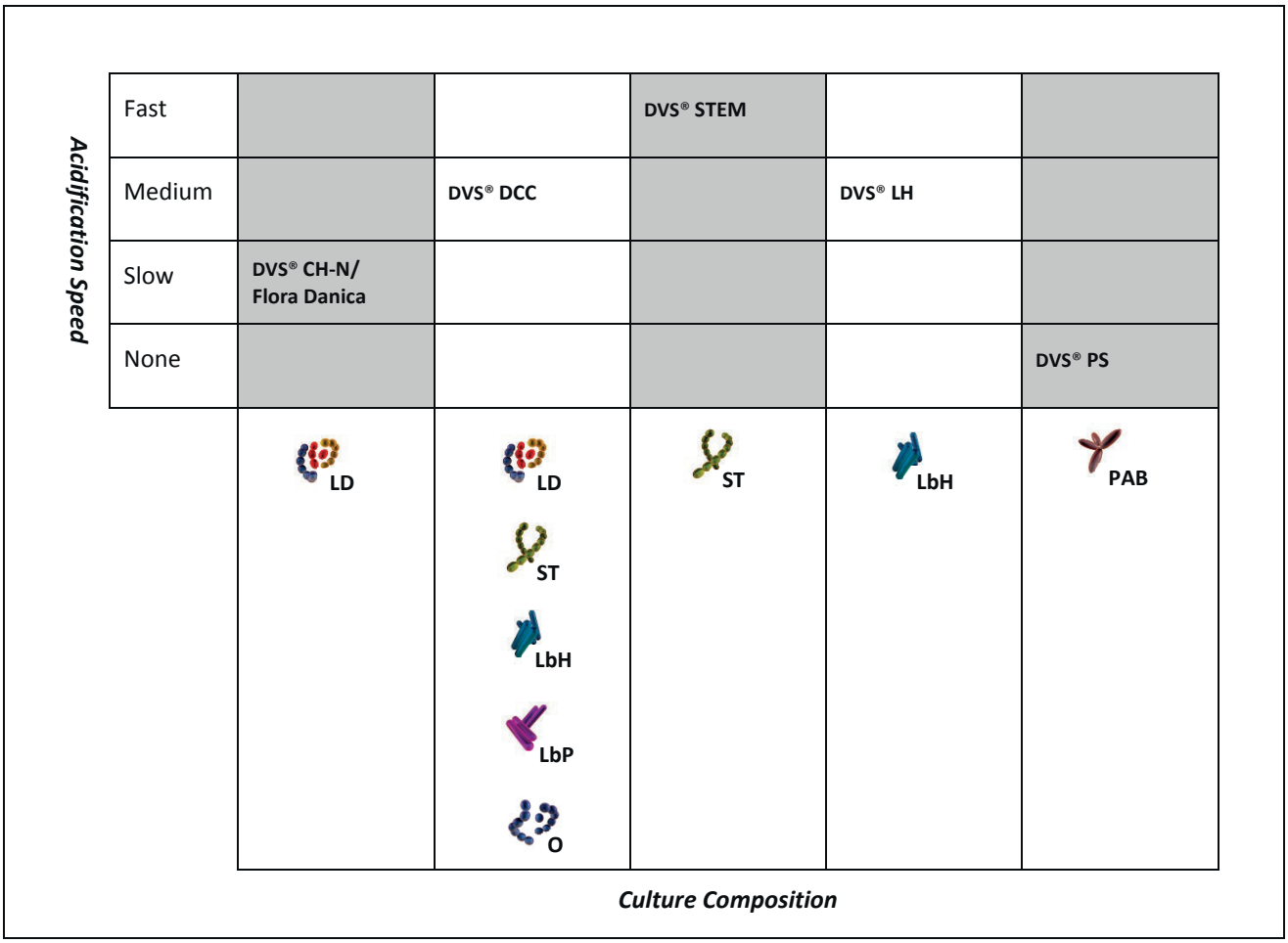
This series is available in frozen form.

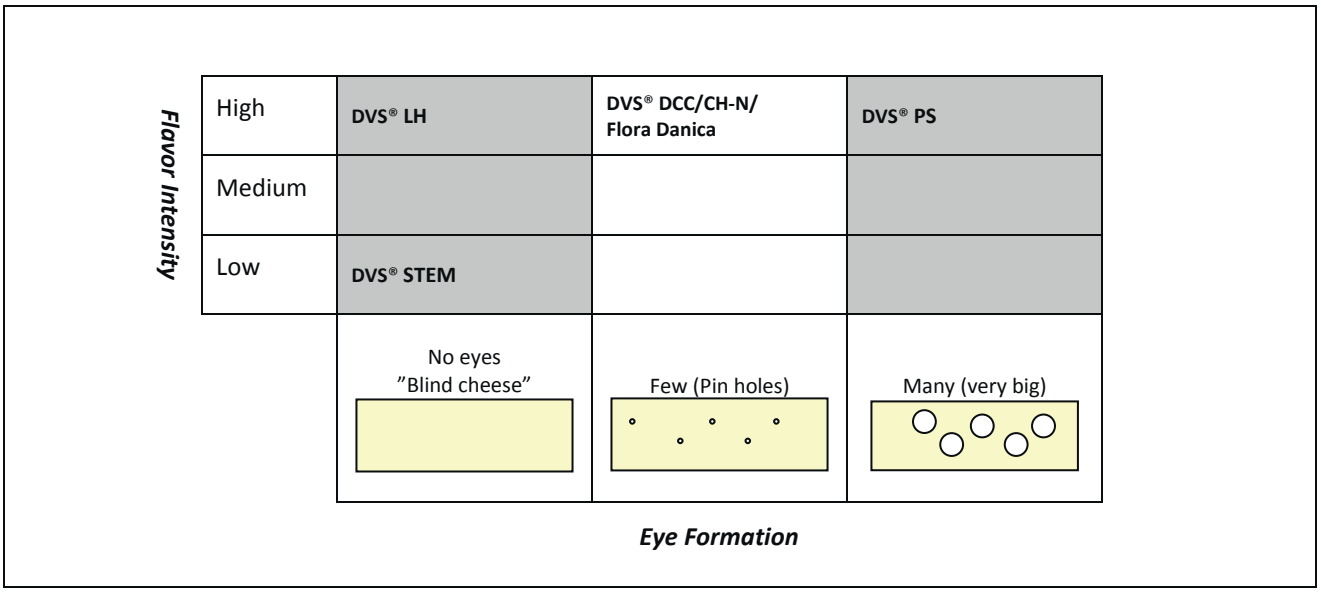
Frozen

Storage: -45°C/-49°F

Introduction to Propionic Cheese Cultures

The figure below provides an overview of the different culture series that belong to the Propionic cheese "family". The cultures mainly differ from each other in acidification speed, eye formation and flavor intensity.





DVS® Flora Danica/CH-N

Flora Danica and CH-N are unique set of solutions build on extensive field experience and designed by combining many mesophilic strains. This makes you able to fully capitalize on the value of consistency in cheese production. The cultures are heterofermentative and will generate pin holes depending on the scalding temperatures. The many different strains in the blend ensure good protection against bacteriophage. These series - and especially the Flora Danica and CH-N-19 - are known for the exceptional “full flavor” that they provide to the finished cheese. These culture series has optimum performance at scalding temperatures below 37°C (99°F), so the use for acidification is restricted to Maasdam type of cheese.

Culture composition

LD

Culture Performance

Acidification speed:	■ ■ □ □ □
Phage robustness:	■ ■ ■ ■ ■
Contribution to flavor:	■ ■ ■ ■ ■
Gas production:	■ ■ ■ □ □

Product Form

This series is available in various frozen and freeze-dried packaging sizes.

Frozen

Storage: -45°C/-49°F

Freeze-dried

Storage: -18°C/0°F

DVS® DCC

This series consists of several different cultures that are all multiple defined blends of many different mesophilic strains. The cultures are heterofermentative and will generate pin holes depending on the scalding temperatures. This group of cultures is recommended for Propionic cheeses, since they mainly consist of LD culture and carefully selected O culture strains added with ST, LbH, and LbP. The cultures are intended for production procedures with scalding temperatures between 37-42°C (99-108°F). The many different strains in the blend ensure good protection against bacteriophage.

Culture composition

LD ST LbH LbP O

Culture Performance

Acidification speed:	■ ■ ■ ■ □
Phage robustness:	■ ■ ■ ■ ■
Contribution to flavor:	■ ■ ■ ■ ■
Gas production:	■ ■ ■ □ □

Product Form

This series is available in various frozen and in a few freeze-dried packaging sizes.

Frozen

Storage: -45°C/-49°F

Freeze-dried

Storage: -18°C/0°F

DVS® STEM

This series is based on thermophilic strains resistant to high scalding temperatures. The series consists of different ST cultures for rotation devoted to Emmenthal. Also, STEM-02 allows the cheese curd to retain more water. It is recommended to use this series in a culture rotation system.

Culture composition

ST

Culture Performance

Acidification speed:	■ ■ ■ ■ ■
Phage robustness:	■ ■ ■ □ □
Contribution to flavor:	■ ■ □ □ □
Gas production:	■ □ □ □ □

Product Form

This series is available in frozen form.

Storage: -45°C/-49°F

DVS® LH

This series is based on *Latobacillus helveticus*. The cultures vary in intensity of proteolysis, extent of acidification, flavor as well as their resistance to scalding temperatures. This allows for stimulation of the growth of propionic acid cultures. Due to their natural resistance to bacteriophage, the cultures do not need any rotation.

Culture composition

LbH

Culture Performance

Acidification speed:	■ ■ ■ □ □
Phage robustness:	■ ■ ■ ■ ■
Contribution to flavor:	■ ■ ■ ■ ■
Gas production:	■ □ □ □ □

Product Form

This series is available in various frozen and freeze-dried packaging sizes.

Frozen

Storage: -45°C/-49°F

Freeze-dried

Storage: -18°C/0°F

DVS® PS

This series is a single strain species of *Propionibacterium freudenreichii* subsp *freudenreichii* or subsp *shermanii*. The cultures are not able to acidify, but will ferment lactate and produce propionate, acetate and carbon dioxide. Additionally, the cultures will provide the finished cheese with characteristic sweet notes and famous large holes.

Culture composition

PAB

Culture Performance

Acidification speed:	■ □ □ □ □
Phage robustness:	■ ■ ■ ■ ■
Contribution to flavor:	■ ■ ■ ■ ■
Gas production:	■ ■ ■ ■ ■

Product Form

This series is available in various frozen and freeze-dried packaging sizes.

Frozen

Storage: -45°C/-49°F

Freeze-dried

Storage: -18°C/0°F

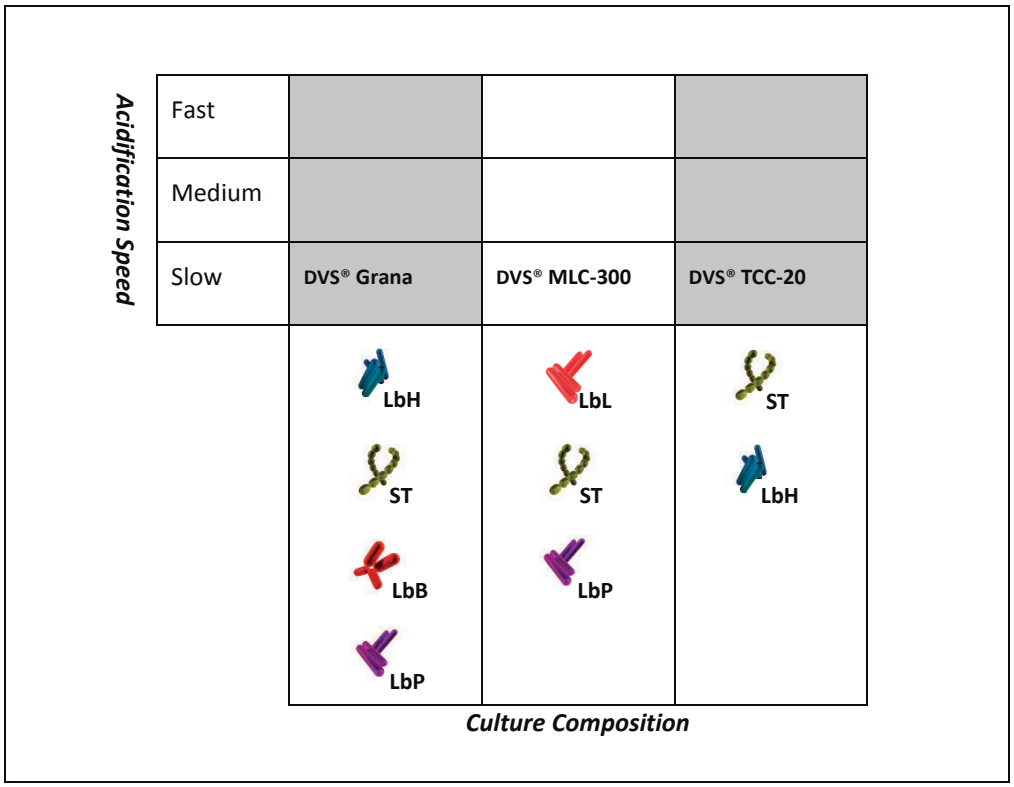
Difference in Flavor Intensity and Eye Formation

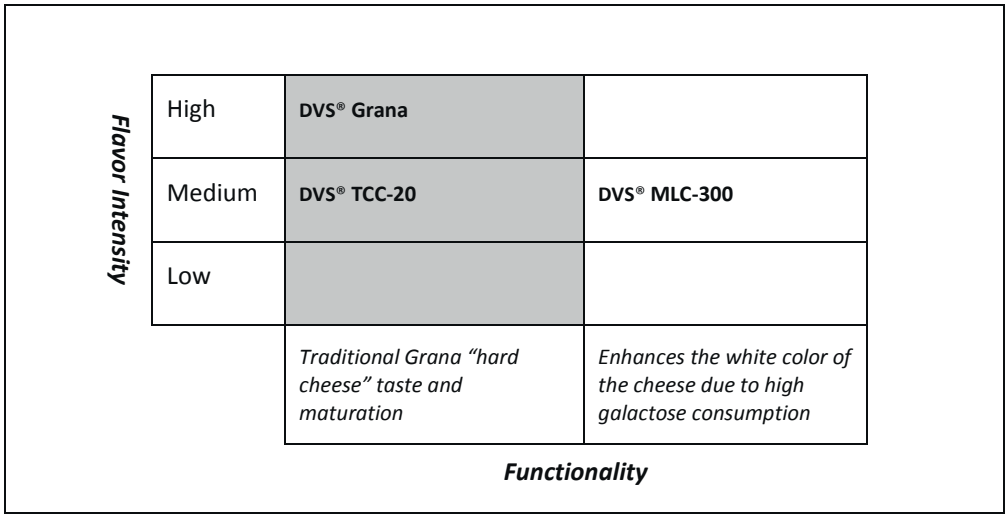
Flavor Intensity				
Typical Rich Propionic			**DVS® PS-40**	
Medium/Rich		**DVS® PS-2**		**DVS® PS-60**
Mild/Medium				
Mild	**DVS® PS-1**			**DVS® PS-80**
	Few	Few-Medium	Medium-Rich	Rich/Multiple

Eye Formation

Introduction to Grana Cheese Cultures

The figure below provides an overview of the different culture series that belong to the Grana cheese "family". The cultures mainly differ from each other in functionality and flavor intensity.





DVS® Grana

This series is composed of thermophilic strains in combination with a blend of *Lactobacillus helveticus*, *Lactobacillus bulgaricus* and *Lactobacillus paracasei*. This culture series is used for long time ripening types of cheeses like Grana and Parmesan, where especially the *Lactobacillus helveticus* contributes to the special flavor development during the ripening. Lastly, the complexity of the Grana culture blends make them very robust against bateriophages.

Culture composition

Culture Performance

Acidification speed:	■ ■ □ □ □
Phage robustness:	■ ■ ■ ■ □
Contribution to flavor:	■ ■ ■ ■ ■

Product Form

This series is available in a standard frozen package size.

Storage: -45°C/-49°F

DVS® MLC-300

This series is suitable for Pecorino or similar types of cheese, where a white color of the cheese is desired. The culture contains *Lactobacillus debruecki* ssp *lactis* strains, which ensures high galactose consumption without development of the typical "hard cheese" taste, caused by *Lactobacillus helveticus* in other Grana cultures.

Culture composition

Culture Performance

Acidification speed:	■ ■ ■ □ □
Phage robustness:	■ ■ ■ ■ □
Contribution to flavor:	■ ■ ■ ■ □

Product Form

This series is available in freeze-dried form.

Freeze-dried

Storage: -18°C/0°F

DVS® TCC-20

TCC-20 is a unique product which consists of a blend of *Streptococcus thermophilus* and *Lactobacillus helveticus* strains. The culture can be used in production of Grana and Parmasan types of cheeses, where it gives flavor notes that are characteristic for the hard and low moisture cheese types.

Culture composition


ST


LbH

Culture Performance

Acidification speed: ■ ■ ■ □ □

Phage robustness: ■ ■ ■ ■ □

Contribution to flavor: ■ ■ ■ ■ ■

Product Form

This product is available in all standard packaging sizes.

Frozen

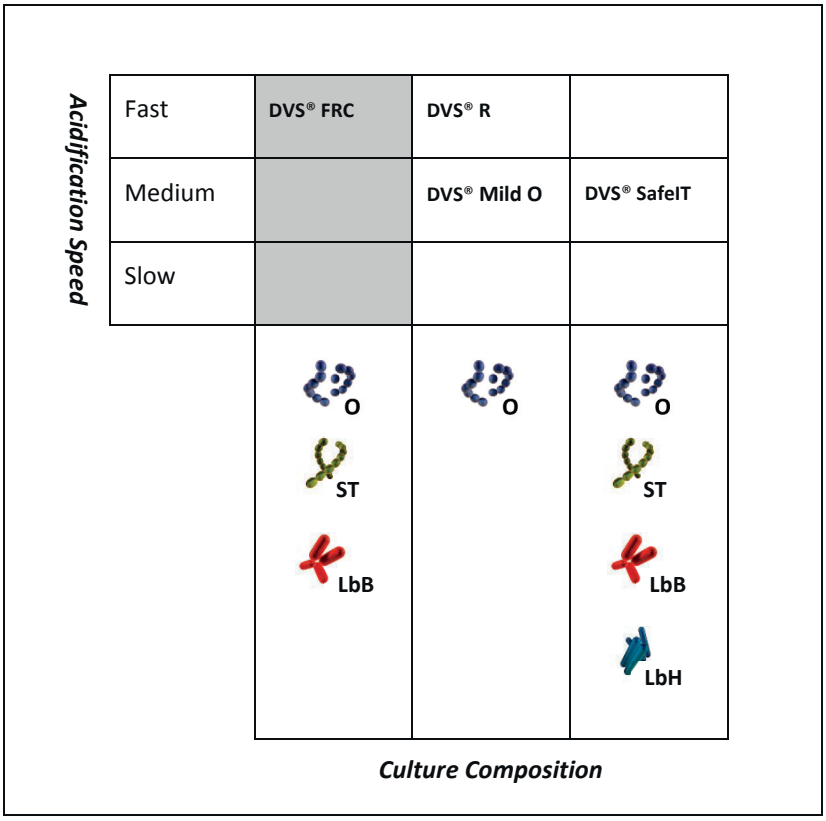
Storage: -45°C/-49°F

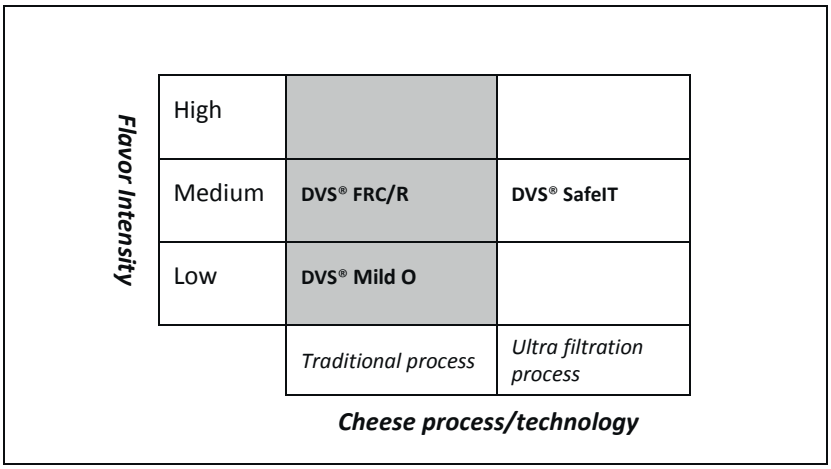
Freeze-dried

Storage: -18°C/0°F

Introduction to White Brined Cheese Cultures

The figure below provides an overview of the different culture series that belong to the White brined cheese "family". This culture group covers traditional Feta and similar White cheeses like Halloumi, Domiati, Telemea and Bjalo. The cultures mainly differ from each other in acidification speed and flavor intensity.





DVS® FRC

FRC is a traditional homofermentative blend of mesophilic O culture, thermophilic *Streptococcus thermophilus* and *Lactobacillus bulgaricus* strains. The cultures are known for good phage robustness, fast acidification speed and closed cheese texture, especially preferred in traditional white cheese made in the Balkan region. It is recommended to use this series in a culture rotation system. The recommended production temperature is 35°C (95°F).

Culture composition

Culture Performance

Acidification speed:	■ ■ ■ ■ ■
Phage robustness:	■ ■ ■ ■ □
Contribution to flavor:	■ ■ ■ □ □

Product Form

This series is available in a freeze-dried form.

Freeze-dried

Storage: -18°C/0°F

DVS® R

One of the major reasons behind the success of Chr. Hansen is the R series solutions. The R series includes a full range of cultures for various cheese productions to fit the demands of the modern cheese producer. This mesophilic homofermentative culture range contains O strains known particularly for rapid acidification and phage resistance which is acknowledge by cheese makers through many years and geographies. Within the series, 03 and 04 are the most phage robust, whereas 07 and 08 are known for good savory flavor formation. Lastly, it is recommended to use this series in a culture rotation system.

Culture composition

Culture Performance

Acidification speed:	■ ■ ■ ■ □
Phage robustness:	■ ■ ■ ■ □
Contribution to flavor:	■ ■ □ □ □

Product Form

This series is available in both frozen and freeze-dried form in all standard packaging sizes.

Frozen

Storage: -45°C/-49°F

Freeze-ried

Storage: -18°C/0°F

DVS® Mild O

Part of white brined cheese production is made with 100% mesophilic O culture. The Mild O is 100% mesophilic culture strains, known particularly for their phage resistant properties. The Mild O is unique in sense no post-acidification and used when a gentle acidification is preferred to avoid bitterness.

Culture composition

Culture Performance

Acidification speed:	■ ■ □ □ □
Phage robustness:	■ ■ ■ ■ □
Contribution to flavor:	■ ■ □ □ □

Product Form

This series is available in both frozen and freeze-dried form in various packaging sizes.

Frozen

Storage: -45°C/-49°F

Freeze-dried

Storage: -18°C/0°F

DVS® SafeIT

SafeIT is developed for the industrial UF white brined cheeses from the Middle East and Balkan regions. It is a blend of both mesophilic and thermophilic strains. SafeIT is designed to improve texture, flavor and bring more certainty to the production, in terms of speed of fermentation and bactoriophage robustness. The recommended composition of the retentate is: Fat: 15-17,5%; Protein: 14-15%; TS:35-40% and optimum fermentation temperatures at 34-35°C.

Culture composition

Culture Performance

Acidification speed:	■ ■ ■ ■ □
Phage robustness:	■ ■ ■ ■ ■
Contribution to flavor:	■ ■ ■ ■ ■

Product Form

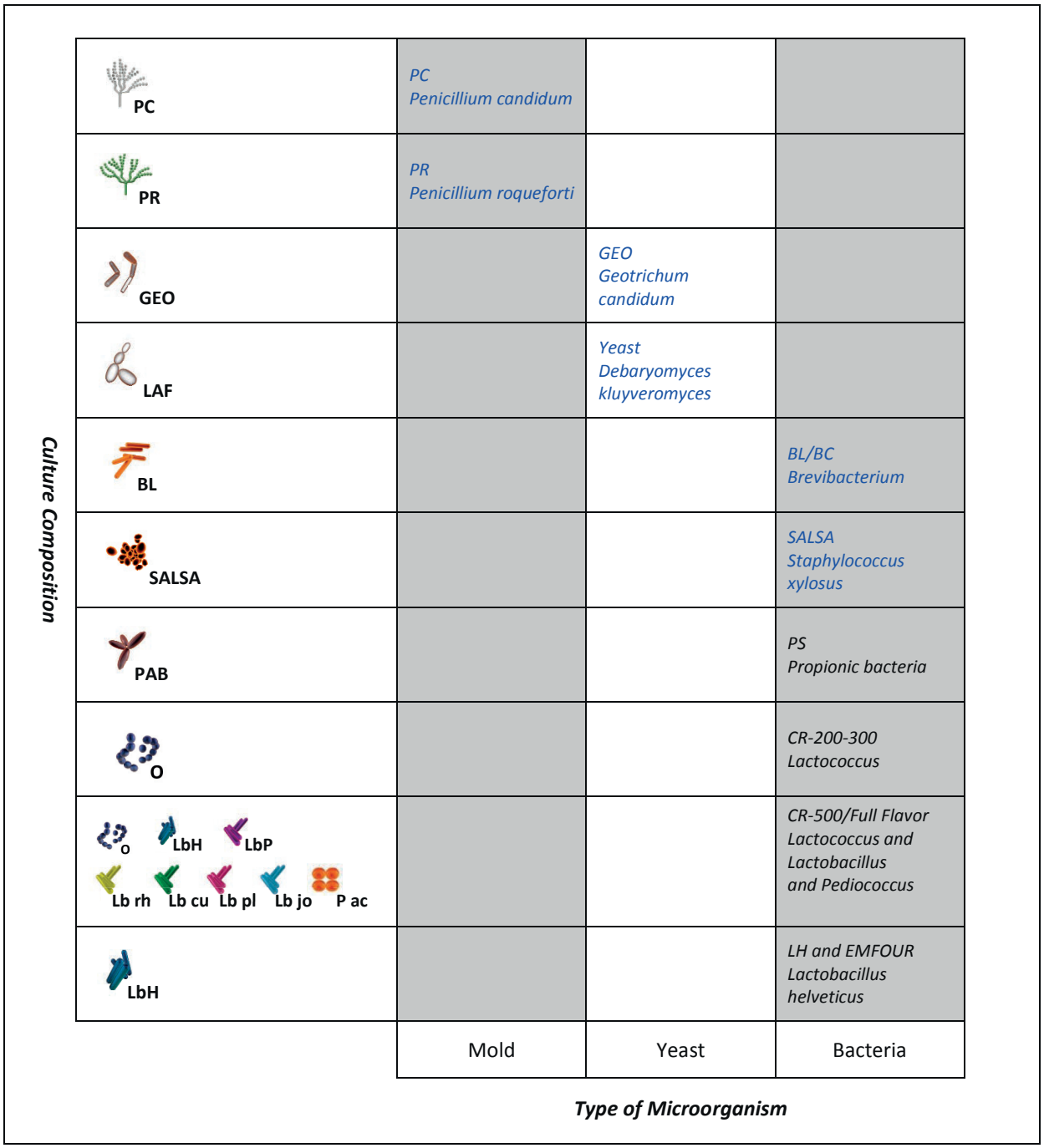
This series is available in a freeze-dried form.

Freeze-dried

Storage: -18°C/0°F

Overview of Ripening Cultures

The cultures in the ripening range vary significantly with different species and many different applications. The figure below provides an overview of the different culture series that belong to the ripening "family". The **blue** colored products are mainly used for surface ripened soft cheese types, and for some smeared continental type of cheeses. The **black** colored products are mainly used for special flavor developments in propionic, continental and cheddar type cheese.



SWING®: Ripening cultures for soft mold types of cheeses and smeared cheeses

The cultures below are aerobic ripening cultures mainly recommended for soft cheeses; Camembert and Brie types as well as blue cheeses, mixed rinds (with red and white surface) and smeared cheeses. The cultures originate from traditional cheeses or brines, and they have been selected for their appearance and/or flavoring properties.

Flavor Development

Degree of Lipolysis				
	High			***PC Penicillium candidum*** ***PR Penicillium roqueforti***
	Medium		***GEO*** ***Geotrichum Candidum***	***SALSA*** ***Staphylococcus xylosus***
	Low	**LAF Yeast**	***BL Brevibacterium***	***BC Brevibacterium***
		Low	Medium	High

Degree of Proteolysis

SWING® PC - Penicillium candidum

This series is composed of *Penicillium candidum* selected for their bright white appearance and moderate metabolic activity. The cultures allow for a white and short homogenous rind. Moreover, PC-A1 is well known for contributing to a longer shelf life, which is due to the low proteolytic activity. Lastly, PC-A3 ensures protection against mucors.

Culture composition

PC

Culture Performance

Growth speed:	■ ■ ■ □ □
Contribution to coating:	■ ■ ■ ■ ■
Contribution to flavor:	■ ■ ■ ■ ■
Gas production:	□ □ □ □ □

Product Form

This series is available in freeze-dried spores with packaging sizes of 10 and 50 units.

Storage: -18°C/0°F

SWING® PR/PRG - Penicillium roqueforti

The PR series is composed with two sub-ranges of *Penicillium roqueforti*. The PR series is recommended for traditional blue cheeses, whereas the PRG cultures were selected for the mild color they bring to Gorgonzola. The cultures in both series differ in color as well as in proteolytic and lipolytic activity. Lastly, PR-1 is well known for its low proteolytic activity, and is recommended for small size cheeses and double cheeses (blue on the inside and white on the outside).

Culture composition

PR

Culture Performance

Growth speed:	■ ■ □ □ □
Contribution to coating:	■ □ □ □ □
Contribution to flavor:	■ ■ ■ ■ ■
Gas production:	□ □ □ □ □

Product Form

This series is available in freeze-dried spores with packaging sizes of 10 units.

Freeze-dried

Storage: -18°C/0°F

SWING® GEO - Geotrichum candidum

This series is composed of strains from yeast. The cultures contribute to the cheese coating, forming a thin rind and bringing a typical flavor to the cheese, while decreasing bitterness. Lastly, some strains - e.g. GEO CB - are able to inhibit the growth of contaminant molds.

Culture composition

GEO

Culture Performance

Growth speed:	■ ■ ■ ■ □
Coating quality:	■ ■ ■ ■ ■
Contribution to flavor:	■ ■ ■ ■ ■
Gas production:	□ □ □ □ □

Product Form

This series is available in liquid arthrospores form in 10 units bottles. The product should be stored in a cool place at 2-4°C (36-39°F).

SWING® LAF - Yeast

This series consists of strains from various species selected for targeted purposes – both neutralizing and fermenting yeast. Neutralizing yeast is devoted to the consumption of lactate resulting in rise of pH, and they develop on the cheese rind. Fermenting yeast produces flavor in the cheese curd, and they grow preferably inside the cheese. The SWING® TRIO is a blend of carefully appointed yeasts, allowing bioprotection towards unwanted molds on the surface of soft cheese and continental cheese types.

Culture composition

LAF

Culture Performance

Growth speed:	■ ■ ■ ■ ■
Contribution to coating:	■ ■ ■ □ □
Contribution to flavor:	■ ■ ■ ■ ■
Gas production:	■ ■ □ □ □

Product Form

This series is available in freeze-dried packaging sizes of 10 units.

Freeze-dried

Storage: -18°C/0°F

SWING® BL/BC - Brevibacterium

The BL series consists of *Brevibacterium linens,* whereas the BC series is a strain of *Brevibacterium casei*. BL gives an orange color to the cheese rind with a typical sulphur flavor. BC provides a high aminopeptidase activity and plays a significant role in the cheese texture, resulting in a round mouth feeling, softness and reduction of bitterness.

Culture composition

BL

Culture Performance

Growth speed:	■ ■ □ □ □
Contribution to coating:	■ ■ ■ ■ ■
Contribution to flavor:	■ ■ ■ ■ ■
Gas production:	□ □ □ □ □

Product Form

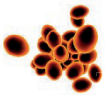
This series is available in freeze-dried packaging sizes of 10 units.

Storage: -18°C/0°F

SWING® SALSA - Staphylococcus xylosus

The SALSA series is devoted to cheese flavoring. Especially SALSA-1 provides a typical aroma of raw milk cheese, giving certain ”farm house” flavor notes to the cheese, due to the culture’s contribution to catabolism of amino-acids. The culture also gives a yellowish color to the cheese rind.

Culture composition



SALSA

Culture Performance

Growth speed:	■ ■ ■ □ □
Contribution to coating:	■ ■ ■ ■ □
Contribution to flavor:	■ ■ ■ ■ ■
Gas production:	□ □ □ □ □

Product Form

This series is available in freeze-dried packaging sizes of 10 units.

Freeze-dried

Storage: -18°C/0°F

Flavor Control™: Ripening Cultures for propionic, continental and cheddar types of cheeses

The cultures below are anaerobic ripening cultures recommended for continental, cheddar and propionic cheese. However, in some cases, it can also be used in soft cheeses and pasta filata. The cultures have been selected for their flavoring properties, such as proteolytic metabolism as well as for their ability to catabolise amino-acids. Their development according to cheese environmental parameters has also been taken into consideration.

PS & Flavor Control™

Culture Composition	Sweet and lipolytic	Sweet and nutty	Debittering and mild	Mature	Mature and Tutti fruity	Buttery
PAB	**DVS® PS**					
LbH		**DVS® LH/ EMFOUR**				
O			**DVS® CR-200-300**			
O LbH LbP		**DVS® CR-520 CR-501**		**DVS® CR-520 CR-501**		
O LbH LbL					**DVS® CR-540**	
O LbP				**DVS® CR-550**		
O Lb pl Lb cu P ac				**DVS® CR-Mature01**		
O LbL Lb jo					**DVS® CR-Bouquet01**	
O Lb rh LbP						**DVS® CR-Buttery01**

Flavor Profile

DVS® PS

This series is a single strain species of *Propionibacterium freudenreichii* subsp. *freudenreichii* or subsp. *shermanii*. The cultures are not able to acidify, but will ferment lactate and produce propionate, acetate and carbon dioxide. Additionally, the cultures provide the final cheese with characteristic sweet notes and famous large holes.

Culture composition

PAB

Culture Performance

Acidification speed:	■ □ □ □ □
Phage robustness:	■ ■ ■ ■ ■
Contribution to flavor:	■ ■ ■ ■ ■
Gas production:	■ ■ ■ ■ ■

Product Form

This series is available in various frozen and freeze-dried packaging sizes.

Frozen

Storage: -45°C/-49°F

Freeze-dried

Storage: -18°C/0°F

DVS® LH/EMFOUR*

The LH series is based on *Latobacillus helveticus*. The cultures vary in intensity of proteolysis and flavor. They enhance cheese maturity and provide various flavor notes to the cheese, especially sweet and nutty. Moreover, LH cultures are galactose positive and contribute to reduce residual sugars in the cheese curd, avoiding secondary fermentation or browning by Maillard reactions.

*EMFOUR use is restricted and cannot be used in Gouda/Edam cheeses.

Culture composition

LbH

Culture Performance

Acidification speed:	■ ■ □ □ □
Phage robustness:	■ ■ ■ ■ ■
Contribution to flavor:	■ ■ ■ ■ ■
Gas production:	□ □ □ □ □

Product Form

This series is available in standard frozen form

Frozen

Storage: -45°C/-49°F

DVS® Flavor Control™ / CR-200-300

This series consists of homofermentative mesophilic O culture strains which are lactose negative or slow lactose fermenting, but with a very high aminopeptidase activity. The cultures give very mild flavor notes to the finished cheese and can remove cheese bitterness. Lastly, the cultures can be used in any type of cheese, but they need to be used in combination with an acidifying culture.

Culture composition

Culture Performance

Acidification speed:	■ □ □ □ □
Phage robustness:	■ ■ ■ ■ ■
Contribution to flavor:	■ ■ ■ ■ □
Gas production:	□ □ □ □ □

Product Form

This series is available in standard frozen packaging sizes.

Storage: -45°C/-49°F

DVS® Flavor Control™ CR-500 / CR-Full Flavor

These series are made of ripening O culture strains blended with various species and strains of Lactobacilli. The cultures are both able to reduce bitterness and build up intense and complex cheese flavors, e.g. fruity, sweet, nutty, caramelized, and savory. All cultures are able to increase cheese maturity. Additionally, CR-500 cultures are particularly devoted to low fat cheeses but can also be used in full fat cheeses, however, all cultures need to be used in combination with an acidifying culture.

Culture composition

Culture Performance

Acidification speed:	■ □ □ □ □
Phage robustness:	■ ■ ■ ■ ■
Contribution to flavor:	■ ■ ■ ■ ■
Gas production:	□ □ □ □ □

Product Form

This series is available in frozen form in cartons.

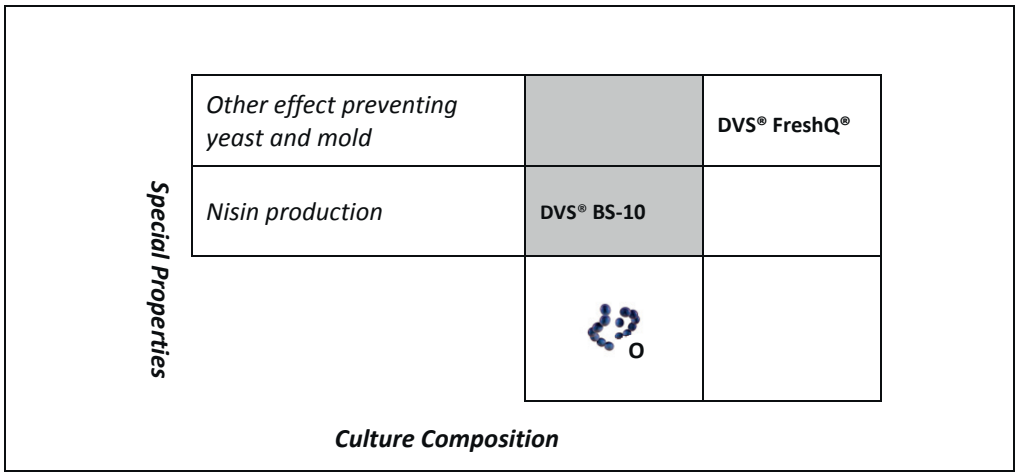
Frozen

Storage: -45°C/-49°F

Introduction to Protective Cultures

DVS® BioSafe™ is Chr. Hansen's response to gram positive spoilages, e.g. *Bacillus* and *Clostrium*, for cheese manufacturers who want to go natural. BS-10 can improve bio-control during the process and provide more homogeneous products with improved quality of the final cheese. BS-10 has a controlled production of nisin that inhibits microbial growth. This culture should be used in combination with a DVS® acidifying starter culture.

DVS® FreshQ® is Chr. Hansen's way of utilizing the power of nature to inhibit growth of yeasts & molds that reduce shelf-life and negatively impact the quality of many dairy products. Sorbic acid and it's calcium, sodium and potassium salts or natamycin are means to prevent unwanted yeast and mold – but it is not in line with consumer trends of natural and clean labels. effective in preventing unwanted yeast and mold - but it's not in line with consumer trends of natural and clean labels. DVS® FreshQ® consists of natural microorganisms with the potential to inhibit unwanted contaminants like yeast and mold through fermentation. DVS® FreshQ® cultures add an additional hurdle to your quality assurance program and enhances the effectiveness of your sanitation program – with no negative flavor impact.



DVS® BS-10

This O culture ProtectIT/BS-10 produces nisin that inhibits microbial growth, and thereby extends shelf life for some products. More specifically the ProtectIT/BS-10 show antimicrobial activity against several Gram-positive bacteria, including spore-formers such as *Clostridium* and *Bacillus* subsp.

Culture composition

Culture Performance

Acidification speed:	■ ■ □ □ □
Phage robustness:	■ ■ ■ ■ □
Contribution to flavor:	■ □ □ □ □
Gas production:	□ □ □ □ □

Product Form

This series is available in frozen form.

Frozen

Storage: -45°C/-49°F

DVS® FreshQ®

FreshQ® cultures are used in combination with the existing DVS® acidifying culture. It is a natural solution to prevent or delay the growth of yeast and molds over the shelf-life of cheese. The FreshQ® cultures are based on unique strains of lactic acid bacteria working in synergy with the starter culture during fermentation. They are developed to give superior antifungal activity as well as low technological and sensory impact on the cheese. In fact, they often contribute positively to the freshness and creaminess. The efficiency of FreshQ® will depend on factors such as cheese type, make conditions, contamination level, cool-chain etc.

Product Form

This product is available in various frozen and freeze-dried packaging sizes.

Frozen

Storage: -45°C/-49°F

Freeze-dried

Storage: -18°C/0°F

DVS® Butter - D-series

Butter is produced by a traditional churning process or a continuous process. Both processes are adjusted according to seasonal variances in milk composition. In order to get the acidification and the aroma production the preferred direct inoculation cultures are the DVS® CHN-22 to get a higher acidification speed and inoculation using 2000 to 4000 Units per 10 tons of cream. In addition to these DVS® cultures it is needed also to add an aromatic culture like DVS® CHD-1 or DVS® CHD-2 to increase the diacetyl flavor. The culture F-DVS® CHD-2 is inoculated in an amount of 500 Units per 2.000 liters of milk.

This DVS® series consists of defined Lactococcus lactis spp. lactis diacetylactis. The cultures are homofermentative and known for flavoring properties, bring fresh, creamy and buttery notes to the butter or spread product.

Culture composition

D

Culture Performance

Acidification speed:	■ ■ □ □ □
Phage robustness:	■ ■ ■ ■ □
Contribution to flavor:	■ ■ ■ □ □
Gas production:	■ ■ ■ □ □

Product Form

This series is available in 500g frozen cartons.

Frozen

Storage: -45°C/-49°F

Introduction to KFP™

All Chr. Hansen cheese cultures are Kosher certified, however, several other cultures are also certified special *Kosher for Passover* (KFP™). The figure below provides an overview of the different cultures in the Chr. Hansen KFP™ series that all have been certified *Kosher for Passover*. All these cultures have similar performance as the regular versions. The specific product KFP™ CHEESE is similar to that of the Fresco® series, and therefore, KFP™ CHEESE can be used as an alternative to Fresco® cultures, when *Kosher for Passover* is required.

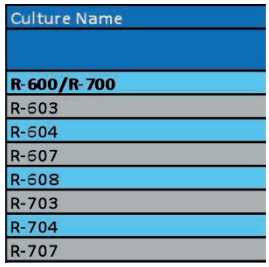
Special Characteristic	KFP™ CH-N-19	KFP™ R-604 KFP™ R-608	KFP™ CHEESE	KFP™ LH-17	KFP™ PS-1	KFP™ STC-7
Kosher for Passover certificate available	LD	O	O ST	LbH	PAB	ST

Culture Composition

The KFP™ cultures are available in standard 500 U frozen packaging sizes, except from the KFP™ CHEESE which is available in 1000 U bag.

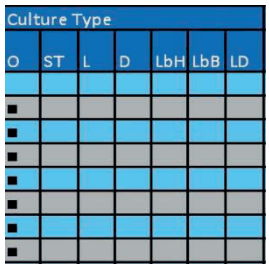
Our Product Range & How to use it

The names of all our cultures in our range are listed in the coming pages. Besides from the name there is also information about ***Culture Type***, ***Culture Performance***, ***Product Form*** and the ***Item Number*** that is used when ordering the culture.



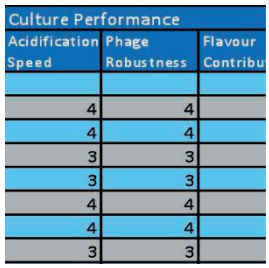
Culture Name
R-600/R-700
R-603
R-604
R-607
R-608
R-703
R-704
R-707

Culture Name
All our cultures have individual names. Usually, there are several individual cultures e.g. R-603, R-604, R-607, etc. within a certain culture series e.g. the R-600 series. Ideally, the user will frequently switch between the individual cultures within a series; this will enhance the plant's protection against costly phage attacks. Before setting up a culture rotation scheme, always consult your local Chr. Hansen Sales Representative.



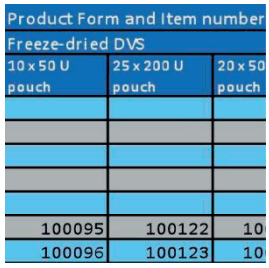
Culture Type						
O	ST	L	D	LbH	LbB	LD
■						
■						
■						
■						
■						
■						
■						

Culture Type
The main microorganism present in the culture is indicated under the Culture Type part of the table. For more information about the different components and the actual species name behind the abbreviations O, L, LD etc., go to page 4-5.



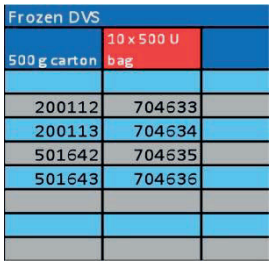
Culture Performance		
Acidification Speed	Phage Robustness	Flavour Contribu
4	4	
4	4	
3	3	
3	3	
4	4	
4	4	
3	3	

Culture Performance
Cultures in this catalogue are classified by their performance and functionality for: Acidification Speed, Phage Robustness, Flavor Contribution and when relevant also Gas Production. The scale is a 5-level scale from 1 (low) to 5 (high).



Product Form and Item number		
Freeze-dried DVS		
10 x 50 U pouch	25 x 200 U pouch	20 x 50 pouch
100095	100122	10
100096	100123	10

Product Form and Item Number
Many of our products are produced both in a freeze dried and a frozen version and sometimes in many different packaging formats e.g. 50, 200, and 500 Units.
To find the right product format for your application look for the material number that is listed in the column with the format you desire. Use the Item Number and Culture Name when ordering products.



Frozen DVS		
500 g carton	10 x 500 U bag	
200112	704633	
200113	704634	
501642	704635	
501643	704636	

New & improved packaging format for frozen DVS® cultures
Chr. Hansen will gradually start to change the packaging format of frozen cultures from 500 gram carton to 500 unit bags in box. The new item numbers in concern are easily located in the column marked red.

Standard Range											Product Form and Item number						
Culture Name	Culture Type							Culture Performance			Freeze-dried DVS			Frozen DVS			
	O	ST	L	D	LbH	LbB	LD	Acidification Speed	Phage Robustness	Flavor Contribution	10 x 50 U pouch	25 x 200 U pouch	20 x 500 U pouch	10 x 50 U bag	10 x 500 U bag		
R-600/R-700																	
R-603	■							4	4	2					704633		
R-604	■							4	4	2					704634		
R-607	■							3	3	3					704635		
R-608	■							3	3	3					704636		
R-703	■							4	4	2	100095	100122	100156				
R-704	■							4	4	2	100096	100123	100157				
R-707	■							3	3	3	100097	100124	100158				
R-708	■							3	3	3	100098	100125	100159				
RST																	
RST-225	■	■						5	5	2					704666		
RST-245	■	■						5	5	2					704667		
RST-255	■	■						5	5	2					704668		
RST-290	■	■						5	5	2					704669		
RST-630	■	■						4	5	2					704643		
RST-631	■	■						4	5	2					704644		
RST-632	■	■						4	5	2					704648		
RST-633	■	■						4	5	2					704649		
RST-634	■	■						4	5	2					704655		
RST-635	■	■						4	5	2					704654		
RST-643	■	■						4	5	2					704637		
RST-676	■	■						4	5	2					704638		
RST-743	■	■						4	5	2	100239	100242					
RST-744	■	■						4	5	2		100410	100409				
RST-776	■	■						4	5	2		701877	100247	710303			

Standard Range											Product Form and Item number						
Culture Name	Culture Type							Culture Performance			Freeze-dried DVS			Frozen DVS			
	O	ST	L	D	LbH	LbB	LD	Acidification Speed	Phage Robustness	Flavor Contribution	10 x 50 U pouch	20 x 500 U pouch		10 x 500 U bag			
RSF																	
RSF-80 (YY-80)	■	■			■			4	5	5				704639			
RSF-105 (YY-105)	■	■			■			4	5	5				704640			
RSF-621	■	■			■		■	4	5	5				704641			
RSF-636	■	■			■			4	5	5				704645			
RSF-637	■	■			■			4	5	5				704646			
RSF-638	■	■			■			4	5	5				704647			
RSF-639	■	■			■			4	5	5				704652			
RSF-640	■	■			■			4	5	5				704651			
RSF-641	■	■			■			4	5	5				704653			
RSF-651	■	■			■			4	5	5				705251			
RSF-653	■	■			■			4	5	5				705254			
RSF-736	■	■			■			4	5	5	703081	703082					
RSF-742	■	■			■			4	5	5	703061	703063					
Mild O™																	
MO-1	■							3	4	3				704904			
MO-2	■							3	4	3				704930			
MO-3	■							3	4	3				704706			
MO-10	■							3	4	3	706425	706428					
MO-20	■							3	4	3	706426	706429					
MO-30	■							3	4	3	706427	706430					

Standard Range											Product Form and Item number						
Culture Name	Culture Type							Culture Performance			Frozen DVS						
	O	ST	L	D	LbH	LbB	LD	Acidification Speed	Phage Robustness	Flavor Contribution	6 x 1000 U bag	10 x 500 U bag					
CC																	
CC-02	■							4	4	2		704710					
CC-04	■							4	4	2		704711					
CC-06	■							4	4	2		704712					
CC-08	■							4	4	2		704713					
Fresco-1000																	
Fresco 1000-11	■	■						5	5	2	702775						
Fresco 1000-21	■	■						5	5	2	702406						
Fresco 1000-50	■	■						5	5	2	674511						
Fresco 1000-70	■	■						5	5	2	683732						
Fresco 1000-81	■	■						5	5	2	702412						
Fresco-3000																	
Fresco 3000-10	■	■						5	5	2	697941						
Fresco 3000-20	■	■						5	5	2	697942						
Fresco 3000-30	■	■						5	5	2	697943						
Fresco 3000-40	■	■						5	5	2	697944						
Fresco 3000-50	■	■						5	5	2	697945						

Standard Range											Product Form and Item number						
Culture Name	Culture Type							Culture Performance			Freeze-dried DVS			Frozen DVS			
	O	ST	L	D	LbH	LbB	LD	Acidification Speed	Phage Robustness	Flavor Contribution	10 x 50 U pouch	25 x 200 U pouch	20 x 500 U pouch	500 g carton	10 x 500 U bag		
STI																	
STI-06		■						5	5	2				690180	704889		
STI-07		■						5	5	2				705900	705901		
STI-08		■						5	5	2				708499	707752		
STI-09		■						5	5	2				708500	707753		
STI-12		■						5	5	2	697990	697993	705353				
STI-13		■						5	5	2	698004	697994	705355				
STI-14		■						5	5	2	697997	698000	705357				

Standard Range											Product Form and Item number						
Culture Name	Culture Type							Culture Performance			Freeze-dried DVS			Frozen DVS			
	O	ST	L	D	LbH	LbB	LD	Acidification Speed	Phage Robustness	Flavor Contribution	10 x 50 U pouch	25 x 200 U pouch	20 x 500 U pouch	10 x 500 U bag			
TCC																	
TCC-3		■				■		3	3	4	100137		100140				
TCC-4		■				■		3	3	4	100142		100144				
TCC-5		■				■		3	3	4			601695				
TCC-6		■				■		3	3	4			601697				
TCC-20		■			■			3	4	5	100145	100197	100227	704873			

Standard Range												Product Form and Item number					
Culture Name	Culture Type							Culture Performance				Freeze-dried DVS			Frozen DVS		
	O	ST	LbH	LD	LbP	D	L	Acidification Speed	Phage Robustness	Flavor Contribution	Gas Production	10 x 50 U pouch	25 x 200 U pouch	20 x 500 U pouch	250 g carton	500 g carton	10 x 500 U bag
LD-Series																	
CHN-11				■				2	4	5	3	100099	100126	100160			704679
CHN-12				■				2	4	5	3					200116	704697
CHN-13				■				2	4	5	3					200117	704787
CHN-14				■				1	4	5	4					200118	704905
CHN-15				■				1	4	5	4					200119	704906
CHN-19				■				2	4	5	3	100100	100127	100161			704681
CHN-22				■				1	4	5	4					501594	704794
CHN-120				■				2	4	5	3						704680
FLORA DANICA				■				1	4	5	4	100103	100129	100163			704685
FLORA TRADI				■				2	4	5	3					683166	704707
FLORA FRESH				■				1	4	5	4					684987	704925
FMD-0046				■				2	4	5	4					620457	704919
FMD-0114				■				2	4	5	3					620669	704920
D-cultures																	
CHD-1						■		2	4	4	3					619629	704918
CHD-2						■		2	3	4	2					705026	705412
SDMB-4						■		2	4	4	3					201176	704913
SDMB-5						■		2	4	4	3					617507	704915
SDMB-6						■		2	4	4	3					617875	704916
SDMB-7						■		2	4	4	3					608171	704914
L-Series																	
CAF							■	1	4	4	3					619221	704780
Ln. BLUE							■	1	4	4	4				708281		

Standard Range												Product Form and Item number					
Culture Name	Culture Type							Culture Performance				Frozen DVS					
	LD	O	L	D	ST	LbH	LbB	Acidification Speed	Phage Robustness	Flavor Contribution	Gas production	10 x 500 U bag	5 x 750 U bag	7 x 750 U bag			
EASY-SET® FLORA™ Continental																	
FLORA™ C150		■						4	5	2	0	710588	708649				
FLORA™ C160		■						4	5	2	0	710589	708650				
FLORA™ C950		■	■					4	5	3	2	708652	708651				
FLORA™ C960		■	■					4	5	3	2	708654	708653				
FLORA™ C1050		■	■	■				4	5	4	3	708656	708655				
FLORA™ C1060		■	■	■				4	5	4	3	708658	708657				
FLORA™ C501	■							3	5	4	3	710342		692798			
FLORA™ C502	■							3	5	4	3	708597		692780			
FLORA™ C503	■							3	5	4	3	708599		703153			

Standard Range												Product Form and Item number					
Culture Name	Culture Type							Culture Performance				Freeze-dried DVS		Frozen DVS			
	O	ST	LbH	LD	LbP	D	L	Acidification Speed	Phage Robustness	Flavor Contribution	Gas Production	25 x 200 U pouch	20 x 350 U pouch	350 g carton	10 x 350 U bag	10 x 500 U bag	
DCC-Series																	
Group 1																	
DCC-230	■			■				3	4	4	3					704683	
DCC-232	■			■		■		3	4	5	4					704690	
DCC-240				■				3	4	5	3					704682	
Group 2																	
DCC-250		■	■	■				3	5	4	3	615458					
DCC-260	■	■	■	■	■			3	5	5	3		668195		704687		
DCC-265	■	■	■	■	■			3	5	5	3			707701	706620		
DCC-275	■	■	■	■	■			3	5	5	3			707702	706621		
DCC-290	■	■	■	■	■			3	5	5	3		702933				
YY-88	■	■	■	■				4	5	5	3					704754	

Standard Range											Product Form and Item number						
Culture Name	Culture Type							Culture Performance			Freeze-dried DVS						
	O	ST	L	D	LbH	LbB	LD	Acidification Speed	Phage Robustness	Flavor Contribution	10 x 50 U pouch						
FRC-60	■	■				■		5	4	4	100094						
FRC-65	■	■				■		5	4	4	100232						
FRC-70	■	■				■		5	4	4	615639						
FRC-75	■	■				■		5	4	4	615640						
SafeIT-Series																	
SafeIT 1	■	■			■	■		5	5	5	704553						
SafeIT 2	■	■			■	■		5	5	5	704555						
SafeIT 3	■	■			■	■		5	5	5	704556						

Standard Range									Product Form and Item number						
Culture Name	Culture Type				Culture Performance				Freeze-dried DVS		Frozen DVS				
	ST	L	LbH	PAB	Gas Production	Acidification Speed	Phage Robustness	Flavor Contribution	10 x 5 U / 10 x 50 U pouch	25 x 200 U pouch	20 x 500 U bag	16 x 250 U / 20 x 250 U bag	10 x 500 U bag	250 U carton	10 x 250 U bag
PS-1				■	2	0	5	4	100118				704891		
PS-2				■	3	0	5	4					704892		
PS-4				■	4	0	5	5	100121			704894	704893		
PS-40				■	4	0	5	5					704896		
PS-60				■	5	0	5	4			704898		704898		
PS-80				■	5	0	5	4			708144				
LH-B01			■		0	2	5	3					704803		
LH-B02			■		0	2	5	5	100116	100185			704804		
LH-B03			■		0	2	5	5					705257		
LH-32			■		0	2	5	5				704806			
STEM-02	■				0	5	4	2						674715	704757
STEM-03	■				0	5	4	2						674716	704758

Standard Range									Product Form and Item number						
Culture Name	Culture Type				Culture Performance				Freeze-dried DVS		Frozen DVS				
	ST	O	LbB	D	Gas Production	Acidification Speed	Phage Robustness	Flavor Contribution	10 x 50 U pouch	25 x 200 U pouch	250 g carton	500 g carton	20 x 250 U bag	10 x 500 U bag	
SSC															
SSC-17	■				0	3	3	1				201132		704912	
SSC-100	■				0	3	4	1				699475		704927	
SSC-101	■				0	3	4	1				703372		704931	
SSC-102	■				0	3	4	1						708622	
SSC-103	■				0	3	4	1						708621	
ST-B01	■				0	3	4	1	100113	100183		501692		704900	
ST-B05	■				0	3	4	1				200146		704908	
BA-201	■				0	5	4	1			699117		704901		
BA-202	■				0	5	4	1			699131		704902		
BA-203	■				0	5	4	1			699132		704903		
GZ-01	■				0	3	3	1						709944	
GZ-02	■				0	5	3	1						709945	
CZ-03	■				0	4	3	1				677500		704922	
CZ-100	■				0	4	3	1				706665			
YF-221	■		■		0	4	3	1						704965	
GK-01	■		■		0	3	3	1						704924	
Y-CH1	■		■		0	3	5	2						704936	
YF-3331	■		■		0	4	3	1						704969	
Lb. STELLA				■	0	2	4	3						709943	

Standard Range											Product Form and Item number						
Culture Name	Culture Type							Culture Performance			Freeze-dried DVS			Frozen DVS			
	O	ST	L	D	LbH	LbB	LbP	Acidification Speed	Phage Robustness	Flavor Contribution	25 x 200 U pouch			10 x 500 U bag			
GRANA-102		■			■	■	■	3	5	5				704798			
GRANA-103		■			■	■	■	3	5	5				704799			
GRANA-105		■			■	■	■	3	5	5				710781			
GRANA-106		■			■	■	■	3	5	5				710782			
MLC-300		■				■	■	4	4	4	681239						

Standard Range											Product Form and Item number						
Culture Name	Culture Type							Culture Performance			Frozen DVS						
	O	ST	L	D	LbH	LbP	LbL	Acidification Speed	Phage Robustness	Flavor Contribution	10 x 200 U bag	10 x 475 U bag	10 x 500 U bag	6 x 1000 U bag			
CR-213	■							1	5	3	704714						
CR-312	■							1	5	3			704716				
CR-319	■							1	5	3			704717				
CR-520	■				■	■		1	5	5		704718					
CR-540	■				■		■	1	5	5		704719					
CR-550	■					■		1	5	5		704721					
CR-501	■					■	■	1	5	4			711064	706675			
CR-Buttery01								1	5	4			710314				
CR-Mature01								1	5	4			710315				
CR-Bouquet01								1	5	4			710317				
TEXT-01							■	1	5	4			710755				

Standard Range											Product Form and Item number						
Culture Name	Culture Type							Culture Performance			Frozen DVS						
	O	ST	L	D	LbH	LbP	LbD	Acidification Speed	Phage Robustness	Flavor Contribution	10 x 65 U bag	10 x 500 U bag					
EMFOUR					■			1	5	5		704802					
ENZOBACT					■			1	5	5		704805					
BS-10	■							1	4	2	704642						

Standard Range											Product Form and Item number						
Culture Name	Culture Type							Culture Performance			Frozen DVS						
	O	ST	L	D	LbH	PAB	LD	Acidification Speed	Phage Robustness	Flavor Contribution	6 x 1000 U bag	10 x 500 U bag					
Kosher For Passover																	
KFP CHEESE 01	■	■						5	5	2	697228						
KFP CHEESE 03	■	■						5	5	2	699643						
KFP CHEESE 04	■	■						5	5	2	699646						
KFP CHEESE 05	■	■						5	5	2	703376						
KFP R-604	■							4	4	2		704659					
KFP R-608	■							3	3	3		704657					
KFP CHN-19							■	3	2	5		704694					
KFP PS-1						■		0	5	4		704899					
KFP STC-7		■						3	4	1		704881					
KFP LH-17					■			2	5	5		704807					

Standard Range											Product Form and Item number							
Culture Name	Culture Type							Culture Performance			Freeze-dried powder							
	PC	PR	GEO	MIC	LAF	BL	BC	Degree of lipolysis	Degree of proteolysis	Color	10 U pouch	40 U pouch	50 U pouch					
SWING®																		
PC-Series																		
SWING FD PCA-1	■							3	3	5	660413		660416					
SWING FD PCA-3	■							4	4	5	660450		660451					
SWING PC TT-033	■							4	4	4	670630							
PR-Series																		
SWING P.R. PR-1		■						3	2	5	200680							
SWING P.R. PR-3		■						4	5	5	200681							
SWING P.R. PR-4		■						4	5	5	200977							
SWING P.R. PRG-3		■						4	2	5	600740							
GEO-Series																		
SWING FD GEO CH			■					4	2	5	683643							
SWING GEO CA			■					4	2	5	200691							
SWING GEO CB			■					4	3	3	200692							
SWING GEO CD-1			■					3	2	4	200693							
LAF-Series																		
SWING YEAST LAF-3						■		1	1	1	200941	674031						
SWING YEAST LAF-4						■		1	2	1	200865							
SWING YEAST LAF-5						■		1	2	1	201016							
SWING YEAST LAF-7						■		1	2	1	610590	674032						
SWING YEAST LAF TRIO						■		1	2	1	201189							
BL/BC-Series																		
SWING B. CASEI BC							■	2	3	1	200702	674029						
SWING B. LINENS BL-1						■		2	2	5	200699							
SWING B. LINENS BL-2						■		2	3	5	200701							
SWING MIC SALSA-1					■			2	3	2	201026	674033						
SWING MIC SALSA-2					■			2	2	1		674035						

DVS® Benefits

- Yield Plus™
- Risk Minus™
- Growth Multiply™
- Process Convenience
- Chr. Hansen Expertise & Competencies

DVS® Benefits

- Yield Plus™
- Risk Minus™
- Growth Multiply™
- Process Convenience
- Chr. Hansen Expertise & Competencies

For further information, visit
www.chr-hansen.com

Chr. Hansen A/S -10-12 Boege Allé
DK-2970 Hoersholm, Denmark
Phone: +45 45 74 74 74