

## CULTURES GUIDE

The cultures used are classified based on their temperature of growth, flavor, and acid production features. Culture companies put together specific blends depending on the style of cheese being made. Most of the blends are standard and can contain anywhere from 2-6 different types (strains) of cultures in varying ratios. Below, you will see some cultures listed contain the same strains of bacteria; however, those cultures are not identical. They each have a different ratio or percentage of strains based on the desired results. Important reference terms regarding cultures: Acidifier: lactic acid producer; Proteolysis: an important process which refers to the breakdown or fermentation of milk proteins; Proteolytic (protein-degrading) enzymes: contribute to development of desirable flavor and texture in virtually all aged cheeses; Diacetyl: A fermentation compound which contributes a desirable buttery aroma to a cheese; Gas production: refers to cultures which produce CO<sub>2</sub>.

	Contents	Supplier	Notes and uses
<b>Mesophilic (NEC) - Crème Fraiche, Chevre, Fromage Blanc, and Fromagina available.</b>	LC + LL + LD + veg. Rennet	NEC	Crème Fraiche, Mascarpone, Chevre, Fromagina, and other open-textured cheeses. Optimum diacetyl production at 70 - 72° F.
<b>Mesophilic (NEC) - Fresh Starter (mother)</b>	LC + LL + LD + LM	NEC	Cottage Cheese, Pot Cheese, Neufchâtel and other soft cheeses.
<b>Mesophilic (Sacco) O36</b>	LC	GC	Moderate/high acidifier with no gas or diacetyl production. Cheddar, Colby, Brick, Jack, Farmers, Limburger, Camembert, Brie, Blue cheese, Mozzarella, Provolone, Parmesan, Romano
<b>Mesophilic (Sacco) MO 030</b>	LL + LC	GC	Moderate/high acidifier with no gas or diacetyl production. Clean flavor, very closed texture, proteolytic during aging. Use for Cheddar, Colby, Monterey Jack, Feta, Chevre, etc.
<b>Mesophilic (Sacco) MO 030R</b>	LL + LC + LD + LM	GC	Moderate acidifier with some gas and high diacetyl production. Havarti, Camembert, Cream cheese, Sour cream, Crème Fraiche, Cottage cheese, Fromage blanc, Chevre frais, St-Maure, Valencay, Cultured butter.
<b>Mesophilic (Abiasa) Aroma Type B1</b>	LL + LC + LD + LM	TBP, GC, DC	Moderate acidifier with some gas and high diacetyl production. Havarti, Camembert, Cream cheese, Sour cream, Crème Fraiche, Cottage cheese, Fromage blanc, Chevre frais, St-Maure, Valencay, Cultured butter.
<b>Mesophilic (Chr Hansen) Flora Danica</b>	LL + LC + LD + LM	NEC, DC	Moderate acidifier with some gas and high diacetyl production. Havarti, Camembert, Cream cheese, Sour cream, Crème Fraiche, Cottage cheese, Fromage blanc, Chevre frais, St-Maure, Valencay, Cultured butter.
<b>Mesophilic (Danisco) Choozit LM057</b>	LM	GC, DC	Low acidifier with very high gas and some diacetyl production. Used as an enhancer for Blue cheese and Gouda along with MM series cultures.
<b>Mesophilic (Danisco) Choozit MA011/MA014/MA016/MA019</b>	LL + LC	GC, DC, NEC	Moderate/high acidifier with no gas or diacetyl production. Clean flavor, very closed texture, proteolytic during aging. Use for Cheddar, Colby, Monterey Jack, Feta, Chevre, etc.
<b>Mesophilic (Danisco) Choozit MD088/MD089</b>	LD	GC, DC, NEC	Low acidifier with moderate gas and high diacetyl production. Used to enhance buttery flavor and produce small eyes in cheese such as Edam/Havarti. Poor acidifier, use with MA series culture.
<b>Mesophilic (Danisco) Choozit MM100/MM101</b>	LL + LC + LD	GC, DC, NEC	Moderate acidifier with some gas and high diacetyl production. Use for Brie, Camembert, Havarti, Gouda, Edam, Feta, Blue, Chevre and other buttery, open-textured cheeses. Optimum diacetyl production at 70 - 72° F.
<b>Mesophilic (Danisco) Choozit RA022/RA024/RA026</b>	LL + LC + ST	GC	High acidifier with no gas or diacetyl production.
<b>Mesophilic (Danisco) Choozit SMADL 77</b>	LL + LC + LD + LM	GC	Moderate acidifier with some gas and high diacetyl production. Havarti, Camembert, Cream cheese, Sour cream, Crème Fraiche, Cottage cheese, Fromage blanc, Chevre frais, St-Maure, Valencay, Cultured butter.
<b>Mesophilic Starter (mother)</b>	LL + LC	NEC	Moderate/high acidifier with no gas or diacetyl production. Clean flavor, very closed texture, proteolytic during aging. Cheddar, Monterey Jack, Stilton, Edam, Gouda, Muenster, Blue, and Colby.
<b>Mesophilic (Abiasa) Type II</b>	LC	TBP, GC	Moderate/high acidifier with no gas or diacetyl production. Cheddar, Colby, Brick, Jack, Farmers, Limburger, Camembert, Brie, Blue cheese, Mozzarella, Provolone, Parmesan, Romano
<b>Mesophilic (Abiasa) Type III</b>	LL + LC	TBP, GC	Moderate/high acidifier with no gas or diacetyl production. Clean flavor, very closed texture, proteolytic during aging. Gouda, Edam, Havarti.
<b>Thermophilic (Sacco) Y 082D</b>	ST + LB	GC	Italian-style mozzarella, parmesan, romano, provolone, other Italian cheeses, soft and semi-soft type cheeses. More proteolytic than ST strain alone.
<b>Thermophilic, Italian (Direct Set and Mother available)</b>	ST + DS + LH	NEC	Mozzarella, Parmesan, Provolone, Romano, Swiss, Gruyere, and other Italian style cheeses.
<b>Thermophilic (Danisco) Choozit HOLDBAC LC</b>	Lactobacillus rhamnosus	GC	Used for reducing gas in raw milk cheese.
<b>Thermophilic (Danisco) Choozit LB340</b>	LB	GC	Moderate acidifier of Italian origin.
<b>Thermophilic (Danisco) Choozit LH100</b>	LH + LDL	NEC, GC, DC	Moderate acidifier. Used in combination with TA series cultures for hard cheese, Italian types and Swiss. Primary role is the proteolytic breakdown and flavor production in the later stages of aging.
<b>Thermophilic (Danisco) Choozit MY800</b>	ST + LL + LB	GC	Moderate acidifier. For use in Reblochon and other specialty cheeses.
<b>Thermophilic (Danisco) Choozit TA050/TA052/TA054</b>	ST	GC	Low acidifier used for stabilized cheese.
<b>Thermophilic (Danisco) Choozit TA060/TA061/TA062</b>	ST	GC, DC	High acidifier, good for high temp. scalded cheeses. Culture survives up to 128° F. Parmesan, Romano, Provolone, Mozzarella Emmental/Swiss
<b>Thermophilic (Abiasa) Type B</b>	ST + LB	TBP, DC, GC	Italian-style mozzarella, parmesan, romano, provolone, other Italian cheeses, soft and semi-soft type cheeses. More proteolytic than ST strain alone.
<b>Thermophilic (Abiasa) Type C</b>	ST + LH	DC, GC, TBP	For use in Italian and farmstead type cheeses, Emmentaler, Gruyere, Swiss, and Romano. More proteolytic than ST strain alone.
<b>Farmhouse Culture (Danisco) Choozit MA4001/MA4002</b>	LL + LC + LD + ST	TBP, DC, GC, NEC	Moderate acidifier with some gas and diacetyl production--similar to bacteria balance in raw milk. "Farmhouse" culture used for most types of cheese. Slightly open texture.
<b>Feta Culture (Danisco) Choozit Feta B</b>	LL + LC + ST + LB + LH	DC	Feta. Due to the addition of L. bulgaricus and L. helveticus, it results in a higher proteolytic activity and a creamy texture.
<b>Feta Culture (Danisco) Choozit MT1</b>	LL + LC + ST + LB	TBP, GC	Very high acidifier with no gas or diacetyl production. Used for feta.
<b>Choozit Kazu (Danisco)</b>	LL + LC + LD + LH	GC, DC	Moderate acidifier with some gas and diacetyl production. "Farmhouse" culture for semi-hard and soft cheeses.
<b>Corynebacteria B. Linens (LB and SR3 available)</b>	BL	TBP, NEC, DC, GC	For red/orange (variety LB is ivory) colored rinds on smeared or washed rind cheeses including Brick, Limburger, and Muenster. High pH required for growth.
<b>Corynebacteria MGE</b>	A. Nicotianae	GC	For cream/white colored rind on smeared cheeses.
<b>Corynebacteria SR2</b>	C. Flavescens	GC	For yellow colored rind on smeared cheeses.
<b>Geotrichum Candidum (Geo13, Geo15, and Geo17 available)</b>	G. Candidum	NEC, DC, GC, TBP	Rapid growing mold that prevents unwanted mold growth in moist cheeses. For cheeses requiring P. Candidum or B. Linens. Geo13 produces intermediate flavors, Geo15 is mild, and Geo17 is very mild.
<b>Penicillium Candidum (ABL, HP6, Nieve, SAM3, and VS available)</b>	P. Candidum	TBP, GC, NEC, DC	Produce fuzzy, white mold on the surface of bloomy rind cheeses including Brie, Camembert, Coulommiers, and a variety of French Goat Cheeses. Various strains used to produce a range from mild to very strong flavors.
<b>Penicillium Roqueforti (PA, PJ, PRB1B, PRB6, PV Direct and PS available)</b>	P. Roqueforti, grey-green	TBP, GC, DC, NEC	Creates colored veins, surfaces and flavors in Blue, Roquefort, Gorgonzola, and Stilton cheeses. Various strains used for a range of colors including variations of grey, green, and blue.
<b>Propionic Bacteria</b>	PS	TBP, DC, GC, NEC	Used primarily for the eye formation, aroma, and nutty or buttery flavor production in Swiss type cheeses. Use with other ripening cultures such as Thermo B. Aging at 65 - 75° F with pH 5.4+.

## NON CHEESE CULTURES

Culture	Contents	Supplier	Recommendations
Buttermilk (direct set)	LC + LL + LD + LM	NEC	Buttermilk
Sour Cream	LC + LL + LD + LM	NEC	Sour Cream
Sour Cream & Buttermilk #831		DC	Medium body with full diacetyl flavor and carbon dioxide development
Sour Cream & Buttermilk #901		DC	Thick body with full diacetyl flavor and carbon dioxide development
Yoghurt Culture, Acidophilus		GC	Creates a smooth, low-acid flavored yoghurt.
Yoghurt Culture, Bulgarian		GC	Creates a thick, creamy-style yoghurt.
Yoghurt Culture, Casei Bifidus Acidophilus		GC	Creates a probiotic enriched yoghurt.
Yoghurt Type I	ST + LB	GC	
Yoghurt Type IV	ST + LB + LA	GC	
Yogurt (D5) sweet	LA + ST + LB + Bifidobacterium	NEC	Yogurt
Yogurt (D5) tangy	ST + LB + LL	NEC	Yogurt
Yogurt (Danisco) Choozit ABY 2C	ST + LB + LA + Bifidobacterium	DC, GC	Very high acidifier. Mild flavor and thick body. Includes probiotics.
Yogurt ABY 612	ST + LB + LA + Bifidobacterium	DC	Yogurt. Full flavor and medium body includes probiotics.
Yogurt Bulgarian	ST + LB + other lactic cultures	NEC	Yogurt
Yogurt Culture, Vegetal Dairy-Free	ST + LB + LA + Bifidobacterium + other lacto strains	DC	A blend of freeze-dried lactic acid bacteria specifically selected for use in making dairy-free yogurt.
Yogurt Thermophilic YO Mix 187	ST + LL	GC	Moderate acidifier.
Yogurt Thermophilic YO Mix 492	ST + LB	GC	High acidifier.
Yogurt, Bulgarian 411	ST + LB	TBP	Yogurt

## LEGEND

Strains of bacteria	Strains of bacteria	Type (optimum temp. range)	Function
BL	Brevibacterium linens coryneform bacteria	Secondary Culture	Red/orange smear surface flora
LA	Lactobacillus acidophilus	Misc culture (98-106F, 37-41C)	Lactic acid in making yogurt
LB	Lactobacillus delbrueckii ssp. Bulgaricus	Thermophilic (95-105F, 35-41C)	Lactic acid
LC	Lactococcus lactis ssp. cremoris	Mesophilic (77-86 F, 25-30C)	Lactic acid (salt sensitive >4%)
LD	Lactococcus lactis ssp. lactis biovar. diacetylactis	Mesophilic (77-86 F, 25-30C)	Lactic acid
LDL	Lactobacillus delbrueckii ssp. lactis	Thermophilic (95-105F, 35-41C)	Lactic acid
LH	Lactobacillus helveticus	Thermophilic (95-105F, 35-41C)	Lactic acid
LL	Lactococcus lactis ssp. Lactis	Mesophilic (77-86 F, 25-30C)	Lactic acid, CO2, diacetyl
LM	Leuconostoc mesenteroides ssp. cremoris	Mesophilic (77-86 F, 25-30C)	Lactic acid, slow CO2, diacetyl
PS	Propionibacterium freudenreichii ssp. shermanii	Secondary Culture	CO2, propionic & acetic acid for eye & flavor development.
ST	Streptococcus thermophilus	Thermophilic (95-105F, 35-41C)	Lactic acid

Cheesemaking Suppliers	
DC	Dairy Connection, Inc.
GC	Glengarry Cheesemaking & Dairy Supply
NEC	New England Cheesemaking Supply Co.
TBP	The Beverage People