



Secretariat of Agriculture, Livestock, Fishing and Food Undersecretariat of Agricultural Policy and Food National Food Administration	QUALITY PROTOCOL	
Code: SAA017	Version: 10	08-30--2007

QUALITY PROTOCOL FOR REGGIANITO CHEESE

MADE OFFICIAL ON: January 16, 2008

SAGPyA RESOLUTION Nr: 16/2008

Secretariat of Agriculture, Livestock, Fishing and Food Undersecretariat of Agricultural Policy and Food National Food Administration	QUALITY PROTOCOL	
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INTRODUCTION

In response to consumer demands relative to food production processes, the main foodstuff markets have begun to generate and implement rules, regulations and procedures regarding product harmlessness and quality. Consumers are not only interested in buying foodstuffs that may satisfy certain quality criteria: they also want to learn about product handling throughout the production process. These new conditions that markets have set forth require the application of adequate health control measures to raw materials (in this case milk) and to end products, as well as the adoption of more efficient production systems under strict quality controls.

Reggianito cheese is the most important hard cheese manufactured in Argentina, as it is the most consumed and the most exported. Its background includes the Italian hard cheeses Parmiggiano, Reggiano and Grana Padano. The processing technology of this cheese is an adaptation of the Italian one brought to our country by immigrants.

Consumer preference for differentiated products based on quality of raw materials and/or ingredients, and on information available about processing at origin, in addition to positive trends in cheese consumption in general and of Reggianito in particular have demonstrated the importance of using the Seal “Argentine Food, A Natural Choice” to identify our products.

1. Scope

This protocol defines and describes the quality attributes REGGIANITO Cheese must have to be authorized to carry the Seal “Argentine Food, A Natural Choice” and its Spanish version.


According to chapter VIII of the Argentine Food Code (AFC), Article 635 (Joint Res. SPRS and SAGPyA Nr 33/2006 and Nr 563/2006) the name REGGIANITO Cheese corresponds to: “aged cheeses obtained by milk coagulation by means of rennet and/or other appropriate coagulant enzymes, complemented by the action of specific lactic bacteria”.

The purpose of this document is to provide REGGIANITO cheese manufacturers in the Argentine Republic with an additional tool for obtaining differentiated quality products based on the improvement of the characteristics described by regulations in force.

This protocol establishes the descriptive characteristics of Reggianito cheese, and the required manufacturing process using advanced and traditional technologies that may generate differentiated quality attributes in the end product, focal point of this document.

Being a dynamic document, this protocol may be periodically revised according to the needs of the public and/or private sectors.

Producers aspiring to implement this protocol and comply with the requirements for obtaining the Seal must take into account that compliance with current regulations is implicit. These regulations are described in the Argentine Food Code - AFC - Chapter I “General Resolutions” – (GMC Resolution Nr 080/96 incorporated to the Code by MsyAS Resolution Nr 587/97); Chapter IV “Tools, recipients, containers, packaging, machinery and accessories”, Chapter VIII “Milk products – Art. 605, 610, 611, 611bis, 612 and 635 (Joint Res. SPyRS Nr. 33/2006 and SAGPyA Nr 563/2006); and Chapter V “Packed Food Labeling”, Res. GMC Nr 079/94 “Cheese Identity and Quality”; RES. GMC Nr 069/93 “Microbiological requirements for cheese”; Res. ONCCA 1621/06 “Register of milk operators”.

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Without detriment of the Argentine Food Code provisions, for the purposes of this protocol, REGGIANITO Cheese must also comply with other attributes regarding product, processing and packaging.

The differentiating attributes described in this protocol derive from:

- I Method for obtaining milk.
- II Milk characteristics.
- III Other ingredients and additives used.
- IV Manufacturing process.
- V End product (composition and organoleptic characteristics)

2. General criteria

The differentiating attributes herein described emerge from information provided by different national institutions, private companies, and international references.

Although cheese manufacturers adapt their products to the requirements of each market, it has been possible to unify the different criteria in a product capable of satisfying all the requirements linked with differentiated quality.

It must be pointed out that for complying with this protocol, analyses required must be carried out by laboratories officially authorized for the studies described, following recognized official methods.

3. Grounds for determining differentiating attributes

3.1 Product attributes

Physicochemical and biological parameters as well as sensorial characteristics have been established for obtaining a differentiated Reggianito cheese.


As one of the main ingredients of this product is cow milk, the method for obtaining it and its quality are essential factors for achieving a differentiated end product. For this reason, this document establishes parameters for raw cow milk to assure the desired cheese quality.

3.2 Process attributes

Cheese manufacturers aspiring to obtain the “*Argentine Food – A Natural Choice*” Seal must comply with certain guidelines relative to primary production in order to ensure raw material quality, and must implement the *Good Livestock Production Practices* (GLPP).

Health practices established by the Argentine Food Code for Food Producers/Processing Plants as well as the Hazard Analysis and Critical Control Points System (HACCP) must be implemented in each stage of the manufacturing process of REGGIANITO Cheese.

Storage and transportation conditions must meet the requirements of the harmlessness and quality assurance system applied.

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Companies must provide evidence of having implemented a Traceability System covering the full process from dairy farm to finished product.

Manufacturers must carry out audits at supplier companies to verify if the dairy farms that supply milk for manufacturing REGGIANITO Cheese under the protection of the Seal comply with Good Livestock Production Practices (GLPP), and with the requirements set forth for exporting dairy products to the European Union.

3.3 Packaging attributes

The criterion adopted is to favor the packaging preferred by destination markets, mainly Europe and America, observing current regulations for packaging in general.

4. PRODUCT DIFFERENTIATING ATTRIBUTES

Reggianito cheese is manufactured exclusively with cow milk.

4.1 Obtainment ¹ method and conditions for milk preservation

Only raw or pasteurized² milk from dairy farms free from brucellosis and tuberculosis is used for manufacturing REGGIANITO cheese, in order to guarantee end product harmlessness. Dairy farms that supply the milk must have an official certificate from the National Service for Agricultural Food Health and Quality (SENASA – *Servicio Nacional de Sanidad y Calidad Agroalimentaria*) currently in force.

The raw material used for manufacturing REGGIANITO cheese must be supplied by primary producers where cattle feeding is based mainly on pastures with supplements. Animal feeding must not pass organoleptic defects to cheese.

It has been determined that clinical and/or subclinical mastitis causes changes in the chemical and cellular composition of milk and consequently affects the quality of derived products. For this reason, herds must be duly controlled and their health must be evaluated by means of somatic cell count (SCC) in milk.


It is well known that milk with mesophilic aerobic bacteria counts below 100,000 CFU/ml do not guarantee an adequate cheese ageing process.

Milk for manufacturing REGGIANITO cheese must come from dairy farms where the milking routine includes pre-milking disinfection (also called predipping) with products duly authorized, and later drying of the teat.

Time between milking and processing: maximum 36 hours. For raw milk, not more than 24 hours.

¹ By obtainment method it is understood the mechanical as well as the manual procedure

² Pasteurization: treatment recommended for standardizing products.

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Preservation temperature throughout the whole previous period: maximum 5 °C. For raw milk, maximum 4 °C.

Transportation temperature: maximum 6 °C.

Milk thermization³: Temperature between 65 and 68 °C, during at least 15 consecutive seconds.

4.2 Milk characteristics

The milk used for manufacturing REGGIANITO Cheese must comply with the following requirements:

- a) Be obtained in dairy farms free from brucellosis and tuberculosis, guaranteed by an official certificate from SENASA currently in force.
- b) Somatic cells count: up to 200,000 cells/ml.
[Value corresponding to the mobile arithmetic mean of samples analyzed during a three (3) month period, with at least two (2) samples of raw milk per month taken at the moment of reception at plant].
- c) Mesophilic aerobic bacteria count: up to 100,000 UFC/ml
[Value corresponding to the mobile arithmetic mean of samples analyzed during a two (2) month period, with at least two (2) samples of raw milk per month taken at the moment of reception at plant].
- d) Freezing point equal or lower than -0.512 °C.
- e) Absence of antibiotic residues.
This parameter will be considered fulfilled when the result of microbiological inhibition tests is "Negative".
- f) Acidity: 0.14 to 0.18 (Lactic acid grs / 100cm³)
- g) pH: 6.60 to 6.75.
- h) Density at 15 °C: 1.028 to 1.034 g/ml.
- i) Fat: minimum 3.0 g / 100cm³.
- j) Total proteins: minimum 3.1 g / 100g.

4.3 Other ingredients and additives used

Ingredients and/or additives used must have Quality Certificates from their supplier guaranteeing their genuineness and harmlessness for further technological use.


No addition of caseinates, powdered milk or any kind of fat, including butter and/or cream will be accepted under this protocol.

a. Lactic bacteria culture

Only natural milk ferments and/or whey, selected lyophilized and/or frozen cultures may be used in the manufacturing process for obtaining the desired product taste. The microbiological composition of raw milk and/or whey varies according to the geographic area, and the same occurs with the ferments obtained from them. Therefore, the results obtained in a region cannot be extrapolated to others.

b. Rennet and/or specific coagulants

³ This process has the objective of reducing the number of bacteria (lactic, mesophilic, coliforms, some pathogens and psychophilic) and serves as a procedure for standardizing tastes.

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The use of rennet of microbial origin and rennet with high chymosin content is allowed. These coagulants contribute to avoid bitter tastes and off flavor products.

c. Sodium chloride

Brine to be used must be prepared with semi-fine, pre-washed, free from iodine and food grade salt (Sodium chloride) (AFC: Chapter XVIII "Food Additives" and CODEX STAN 150-1985 - REV. 1-1997, Amendment 1-1999).

d. Calcium chloride

Maximum: 0.02% (200 ppm) by weight, using exclusively anhydric calcium chloride.

This salt must be fit for human consumption before being diluted. The addition of calcium chloride may take place in concentrated solutions provided this does not affect end product content or humidity.

e. Colorants

Only carotenoid colorants of natural origin are authorized for cheese surface coatings.

f. Preservatives

As the use of preservatives in the paste (interior of cheese) is not accepted, the full manufacturing process must take place under more strict health controls.

4.4 End product

REGGIANITO Cheese must have the following characteristics:


a. Sensorial

- Consistency: hard.
- Texture: compact, crumbly and granular.
- Paste (cheese interior): firm, compact, yellowish white to yellowish ivory and without pinkish hues.
- Flavor: salad, slightly hot.
- Aroma: characteristic.
- Rind: Its color may be pale yellow (this is considered natural color) or black (artificially colored). It must be smooth, consistent, well formed, covered by appropriate coatings, adhered or not. Depending on destination markets, the rind may present other colors.
- Eyes and/or mechanical openings: only 2 per cheese are allowed and their diameter must not exceed 3mm.

b. Appearance

- Form: cylinders with flat sides and slightly convex profile.
- Diameter: 24 to 25 cm \pm 1 and height 14 to 15 cm \pm 1.
- Weight: 7.2 Kg \pm 0.6.
- No impurities or foreign substances of any kind are accepted.

REGGIANITO cheeses must obtain not less than 93 points (Extra Quality) in their sensory evaluation pertaining to classification by quality (AFC Article 610 - (Joint Res. SPyRS and

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SAGPyA Nr 33/2006 and Nr 563/2006) in order to qualify for obtaining the quality seal “Argentine Food, A Natural Choice”.

c. Physicochemical characteristics

- Full fat (more than 45% and up to 59.9% of Fat in dry extract).
- Semi-fat (between 25% and 44.9% of Fat in dry extract).
- Humidity (up to 35.9% of low humidity).
- pH: 5.0 a 5.8.

d. Biological characteristics

Microorganisms	Acceptance Criteria	ICMSF Category ⁽¹⁾	Assay Method
Coliforms/ g a (30°C)	n = 5 c = 2 m = 200 M =1000	5	FIL 73A : 1985
Coliforms/ g a (45°C)	n = 5 c = 2 m =100 M = 500	5	APHA 1992, Cap. 24 (1)
Coag. Positive Staphylococcus/g	n = 5 c = 2 m =100 M = 1000	5	FIL 145 : 1990
Salmonella spp / 25 g.	n = 5 c = 0 m = 0	10	FIL 93A : 1985

(1) Compendium of methods for the microbiological examinations of foods. 3r Edition. Published by Carl Vanderzant and Don F. Splittstoesser.

Source: ICMSF – Sampling methods for microbiological analyses. Sample taking method: FIL 50 C:1999.

n: number of sample units analyzed.

c: maximum number of sample units having results between m and M.


m: maximum number of microorganisms in food for having an acceptable quality.

M: maximum level of microorganisms in food for a quality provisionally accepted.


Finished products as well as intermediate ones and raw materials must be free from parasites, mites and any other organisms.

e. Chemical Contaminants

Residues		Limit	Method
Tetracyclines Tetracycline, Oxytetracycline, Chlortetracycline		Less than 20 µg/l	C:HPLC SC
Phenicol	Chloramphenicol	Less than 0.3 µg/l.	CG / ECD C: HPLC – MS-MS
	Florphenicol, Florphenicolamine, Thiamphenicol	Less than 1 µg/l.	
Sulfonamides Sulfadimethoxine, sulfaquinoxaline, sulfamethazine, sulfathiazole, sulfadiazine, sulfamethizole, sulfisoxazole, sulfamerazine, sulfamethoxypyridazine, sulfamethoxazole		Less than 25 µg/l.	SC C:HPLC
Nitrofurantol Metabolites AOZ, AMOZ, AHD, SEM		Less than 0,3 µg/l.	HPLC / MS-MS
Endectocides		Less than 2 µg/l.	HPLC

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Ivermectin, Doramectin, Moxidectin, Abamectin.			
Benzimidazoles Fenbendazole, Oxfendazole, Oxfendazole sulphone, Triclabendazole, Triclabendazole sulphone, Albendazole 2 - aminosulphone		Less than 2 µg/l.	HPLC
Anti-inflammatory agents, non-steroidal Phenylbutazone		Less than 5 µg/l.	HPLC
Residues		Limit	Method
Chemical elements (heavy metals)	Lead	Less than 10 µg/l.	AA –AV
	Cadmium	Less than 3 µg/l.	AA-AV
	Arsenic	Less than 40 µg/l.	AA-VH
	Mercury	Less than 20 µg/l.	AA-CS
Chlorinated pesticides	Hexachlorobenzene, dieldrin, aldrin, hexachlorhexane Alfa-isomer	Less than 0.3 µg/l.	GC/ ECD
	Mirex, hexachlorcyclohexane-beta-isomer	Less than 0.3 µg/l.	GC/ ECD
	Heptachlor: heptachlorepoide	Less than 0.4 µg/l.	GC/ ECD
	Lindane hexachlorcyclohexane Gamma-isomer	Less than 0.3 µg/l.	GC/ ECD
	α:β chlordanes: Oxychlordanes - endrin	Less than 0.3 µg/l.	GC/ ECD
	α:β endosulfane: endosulfan sulphate	Less than 0.5 µg/l.	GC/ ECD
	DDT and metabolites	Less than 0.5 µg/l.	GC/ ECD
	Methoxychlor	Less than 10 µg/l.	GC/ ECD
Phosphorated pesticides	Diazinon	Less than 5 µg/l.	GC/FPD GC/NPD
	Bromophos, ethylbromophos	Less than 5 µg/l	GC/FPD GC/NPD
	Chlorfenvinphos	Less than 2 µg/l	GC/FPD GC/NPD
	Fenitrothion	Less than 0.5 µg/l	GC/FPD GC/NPD
	Chlorpyrifos	Less than 1 µg/l	GC/FPD GC/NPD


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	Ethion	Less than 5 µg/l	GC/FPD GC/NPD
	Fenthion	Less than 5 µg/l	GC/FPD GC/NPD
	Coumaphos	Less than 5 µg/l	GC/FPD GC/NPD
Residues		Limit	Metodologías
Pyrethroids	Permethrin (cis+trans)	Less than 4 µg/l	GC/ECD
	Cypermethrin (+ isomers)	Less than 4 µg/l	GC/ECD
	Deltamethrin	Less than 2 µg/l	GC/ECD
	Flucythrinate	Less than 6 µg/l	GC/ECD
	Cyhalotrin	Less than 2 µg/l	GC/ECD
	Cyfluthrin	Less than 4 µg/l	GC/ECD
	Fenvalerate	Less than 3 µg/l	GC/ECD
Polychlorinated Biphenyls	Congenes: Nr 28, Nr52, Nr 101, Nr 118, Nr 138, Nr 153, Nr 180	Less than 10 µg/l	GC/ECD
Toxins	Aflatoxina M1	Less than 0.1 µg/l.	HPLC TLC/HPLC

HPLC: Liquid Chromatography; TLC: Thin Layer Chromatography; MS: Mass Spectrometry; CG: Gas Chromatography; ECD: Electron Capture Detector; AA: Atomic Absorption; AV: Anodic Voltammetry; VH: Volatile Hydrides; CS: Cold Steam; SC: Screening & Conf (Charm II Test); FPD: Flame Phosphorus Detector; NPD: Nitrogen Phosphorus Detector.

Above mentioned test methods for determining chemical contaminants have been established by the 2006 CREHA Plan and their revisions must be observed as from the moment they become effective.

NOTE: In case other determinations are carried out as a result of external demands or as a consequence of company internal controls that are not mentioned in this protocol, copy of related registers (internal and/or external) must be attached to audits corresponding to the "Argentine Food, A Natural Election" Seal. On the other hand, applicants must submit documentation reporting the frequency of the analyses and grounds for selecting their sampling methods. In all cases analyses must be carried out by laboratories pertaining to official networks following widely accepted official techniques.

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Companies must also have available, in time and form, registers related to all internal controls they carry out, in case they are required at audits connected with the above mentioned Seal system.

5. PROCESS DIFFERENTIATING ATTRIBUTES

Dairy farms that supply milk for manufacturing REGGIANITO Cheese under the seal must comply with Good Livestock Production Practices, as well as with requirements for exporting milk products to the European Union.

Following documents are recommended as reference: "System for the incorporation of dairy farms registered by SENASA" version 05 2006 and later versions when they become effective: EU Supervision Report version 07 from SENASA, Technological Notebook Nr 4 from INTI, Milk Products and the "Code of Good Hygiene Practices for Milk and Milk Products" edited by the Codex Committee for Food Hygiene"

5.1 Harmlessness assurance system

Manufacturing must take place in plants authorized by the national health authority under strict hygiene and safety rules.

REGGIANITO Cheese manufacturers aspiring to obtain the Seal "*Argentine Food, A Natural Choice*" must comply with the Hazard Analysis and Critical Control Points System from reception of raw material to end product.

SENASA Resolution Nr 718/1999 that approved the "Manual for Application of the Hazard Analysis and Critical Control Points System" (HACCP) is recommended as reference.

It is recommended to count with pressurization systems in manufacturing rooms to avoid contamination caused by air as well as to maintain an adequate quality of the air in contact with the product.

5.2 Processing


a. Reception of milk at the plant

Before unloading and transferring milk to a silo, a sample must be extracted from the milk tank truck and the absence of antibiotic residues must be verified by means of rapid tests. Before using the silo milk for manufacturing cheese, its values must be analyzed to verify compliance with point 4 "Milk characteristics".

b. Raw milk preparation

1. Sanitation: milk must be filtered in order to separate physical and/or biological contaminants.
2. Standardization of fat content: by partial skimming.

The relation fat/protein must be between 0.65/0.75 to obtain a semi-fat or full fat cheese respectively.

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3. Thermal treatment: a negative reaction to the alkaline phosphatase test is obtained after this treatment. Method: pasteurization at a temperature of 72-73°C during 15-20 seconds. Milk temperature at leaving the pasteurizer: 31-34°C
4. Thermization: after this treatment milk must react positively to the phosphatase test. Method: Heating to a temperature of 65 to 68°C during at least 15 seconds. Then milk must be cooled to a temperature of 31 – 34°C.

c. Addition of additives and lactic bacteria cultures

Once milk has been thermized or pasteurized the ferment and calcium chloride must be added by means of continuous agitation at a constant temperature of 31 to 34°C.

It is necessary to increase milk acidity by approximately 4°D in relation to values obtained at the beginning of this process (0.14 to 0.18 g. lactic acid/100 cm³), before passing to the next process. If necessary, an acidulant or a mixture of acidulants authorized for this purpose by the Argentine Food Code may be added.

d. Coagulation

At the beginning of this process and before adding a coagulant, milk must have the following characteristics:

1. pH: 6.30 a 6.45.
2. Temperature: 31 to 34 °C.

Then, the rennet or specific coagulants (item 4.3b) are added. They must be diluted by using microbiologically suitable (human consumption quality) free from chlorine water. Coagulation time must be 12 to 25 minutes.

e. Rennet curdling

Uniform grain size: 1 to 3 mm sides.

The acidity of the curdling whey that comes out at the end of curd division must be 6 to 7°D lower than milk acidity.

f. Heating with agitation

After curdling, curd is subject to heating while being agitated. For this purpose temperature must be increased in two stages and according to the ferment used:


1. Temperature increase from 31-34 °C to 45 °C: 1°C each 2 minutes.
2. Temperature increase from 45 °C to 49 °C: 1°C per minute (lyophilized ferment).
3. Temperature increase from 45 °C to 51°C: 1°C per minute (natural ferment).

These temperature increases may be accelerated or delayed according to the grain size obtained and to the titratable acidity of whey at the beginning of the process.

Once heating has been completed grain humidity and bond are verified by means of a grain texture test. If necessary, agitation must continue and temperature reached in this process must be maintained until the desired grain cohesive characteristics are attained.

g. Pressing and Molding

Grains must rest under whey originating pre-pressing by compression. This takes approximately 15 to 20 minutes.

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The curd is placed in molds that are closed with a lid to be piled up in a vertical pneumatic press. The following pressure sequence is recommended:

- 1st hour : 2.0 Kg / cm²
- 2nd hour : 2.5 Kg / cm²
- 3rd hour : 3.0 Kg / cm²
- 4th hour and afterwards : 3.5 Kg / cm²

Note: in case of using microperforated molds, these values may be lower.

Cheese must be turned over from time to time and this generates an inversion of its position inside the mold. This stage of the process takes around 12 hours. If necessary, some superficial drinking water dripping system may be placed on the molds. Water temperature must be similar to that in cheese center.

At pressing completion cheese paste pH must be 4.95 – 5.1.

h. Salting

It is carried out by immersion in brine tanks during 8 – 9 days, 24 to 30 hours per cheese kilogram.

Physicochemical characteristics of brine:

1. Sodium Chloride Concentration: 23 °Be (Boumé)
2. Temperature: 12 – 14 °C
3. Titratable acidity: less than or equal to 30 °D
4. pH: 4.95 – 5.1

Physicochemical controls must be carried out daily and microbiological analyses every 15 days in order to maintain brines within established work ranges. Corrective actions are to be taken when necessary.

i. Extraction and air drying

Cheeses are placed in air drying chambers during 1 day with the purpose of initiating rind formation.


Conditions:

- Temperature: 10 – 15 °C.
- Relative room humidity: 84% ± 2

j. Ageing

Minimum ageing time 8 months (counted as from manufacturing date)

Turning over and cleaning practices are required throughout this period for cheese to acquire its particular characteristics.

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Ageing conditions must be the following:

1. Room temperature: 10 to 15 °C.
2. Relative room humidity: 84 % \pm 2.
3. Cheese turning over: twice a week during 3 months and then once a week until ageing completion.
4. Refrigeration system air speed: 1.5 meters/second.

Antifungal treatments and/or rind cleaning may be carried out if necessary.

k. Washing, shaping, packing, or paraffining or coloring


After these processes cheese must be maintained in expedition chambers or refrigerator at 4°C until leaving the plant.

IMPORTANT: Products covered by this protocol and by SAGPyA Resolution Nr 392/05 must be separated from the rest, and batches and shipments must be correctly identified in order to ensure they are handled separately from products not protected by the Seal. To this end, companies must count with documentation and registers safeguarding the goods carrying this mark.

6. DIFFERENTIATING ATTRIBUTES OF PACKAGING

The use of heat-shrinkable polymeric packaging is accepted under this protocol.

The use of transparent packaging is deemed to enable better perception of product quality by consumers. Likewise, other innovative materials approved by a competent health authority may be considered and evaluated.

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Elaboration of this protocol

This document has been prepared by Mr. Pedro Serrano, technical specialist in the subject selected by the National Food Administration of the SAGPyA for developing this protocol.

Mr. Roberto Castañeda, Director in charge of The National Institute of Industrial Technology (INTI Milk products) and Mr. Eduardo Storani from INTI Rafaela have cooperated in the development of this protocol.

In addition, the following professionals, entities and companies related to the milk sector have been consulted:

- Raúl A. Raimondi, Ch.Eng. from Lácteos Verónica S.A.
- Darío Ghiberto, Eng. – Cheese and whey by-products Production Manager from the company Sucesores de Alfredo Williner S.A.
- Chr. Hansen Argentina S.A.I.C. (Milk Products Division).
- SANCOR.
- Milkaut S.A.
- Roberto José Buccella, Agr.Eng. (Milk Industry Consultant).
- INTA Rafaela Experimental Station.

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Code: SAA118	Version: 02	01.23.2008

Audit date:

Auditing company:

Audited company:

Location:

Head Office:

Town or city:


Telephone:

Name of company's employee responsible for quality / position

Product: Reggianito Cheese

Reference protocol code: SAA017


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RESULTS


Attributes		Compliance		Observations
		YES	NO	
1. Raw Material: Raw or Pasteurized Milk, from dairy farms where cattle feeding is mainly based on pastures with supplements.				Verify register/s.
1.1 Method for processing and preserving milk.				Verify register/s and record result of each analysis.
a. Time between milking & processing.	Pasteurized Milk: max. 36 hours.			Verify register/s and record result of each analysis.
	Raw milk: max. 24 hours			Verify register/s and record result of each analysis.
b. Preservation temperature throughout previous period (a):	Pasteurized Milk: max. 5°C.			Verify register/s and record result of each analysis
	Raw milk: max. 4°C.			Verify register/s and record result of each analysis.
c. Transportation temperature: max. 6°C.				Verify register/s and record result of each analysis.

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Attributes	Compliance		Observations
	YES	NO	
d. Milk thermization: temperature 65 to 68°C.			Verify register/s and record result of each analysis.
1.2 Milk characteristics			
a. Certificate from SENASA guaranteeing that milk comes from Dairy Farms free from Brucellosis and Tuberculosis.			Verify register/s.
b. Somatic cells count: up to 200,000 cells/ml. (Mobile arithmetic mean of samples analyzed during a three (3) month period, with at least two (2) samples of raw milk per month taken at the moment of reception at plant).			Verify register/s and record date and result of each analysis.
c. Mesophilic aerobic bacteria count: up to 100,000 CFU/ ml. (Arithmetic mean of results from samples analyzed during a two (2) month period, with at least two (2) samples of raw milk per month taken at the moment of reception at plant).			Verify register/s and record date and result of each analysis.

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Attributes	Compliance		Observations
	YES	NO	
d. Freezing point: equal or lower than -0.512°C.			Verify register/s and record date and result of each analysis.
e. Antibiotic residues: negative in microbiological inhibition test.			Verify register/s and record date and result of each analysis.
f. Acidity: 0.14 to 0.18 (Lactic acid grs / 100cm ³)			Verify register/s and record date and result of each analysis.
g. pH: 6.60 to 6.75			Verify register/s and record date and result of each analysis.
h. Density at 15°C: 1. 028 to 1. 034 g/ml.			Verify register/s and record date and result of each analysis.
i. Fat: minimum 3.0 g / 100cm ³ .			Verify register/s and record date and result of each analysis
j. Total proteins: minimum 3.1 g/100g.			Verify register/s and record date and result of each analysis.
1.3 Other ingredients and additives employed:			
a. Different types of caseinates, powdered milk, fat (butter and/or cream): not accepted.			Verify inputs and their storage.

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Attributes	Compliance		Observations
	YES	NO	
b. Lactic bacteria culture: compliance with protocol specifications.			Verify register/s and record result of each analysis.
c. Authorized rennet and/or coagulants: rennet of microbial origin and rennet with high chymosin content.			Verify inputs and their storage.
d. Brine prepared with: semi-fine, free from iodine and food grade salt (Sodium chloride).			Verify inputs and their storage
e. Calcium chloride: Maximum: 0.02% (200 ppm) by weight, using exclusively anhydric calcium chloride.			Verify inputs and their storage.
f. Coloring: carotenoids of natural origin in cheese surface coatings.			Verify inputs and their storage.
g. Preservatives: not accepted.			
h. Quality certificate from each supplier.			
2. End Product			

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Attributes	Compliance		Observations
	YES	NO	
2.1 Sensorial characteristics Sensorial evaluation result: minimum 93 points.			Verify register/s.
2.2 Appearance: compliance with calibers defined in the protocol.			Verify register/s.
2.3 Physicochemical characteristics			Verify register/s and record result of each analysis.
a. Full fat: more than 45% and up to 59.9% of fat in dry extract.			Verify register/s and record result of each analysis.
b. Semi-fat: between 25% and 44.9% of fat in dry extract.			Verify register/s and record result of each analysis.
c. Humidity: up to 35.9%.			Verify register/s and record result of each analysis.
d. pH: 5.0 to 5.8			Verify register/s and record result of each analysis.
2.4 Biological characteristics			

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Attributes	Compliance		Observations
	YES	NO	
a. Coliforms/g at 30°C: n=5 c=2 m=200 M=1000 ICMF 5 category Assay method: FIL 73A : 1985			Verify register/s and record result of each analysis.
b. Coliforms/ g at 45°C: n=5 c=2 m=100 M=500 ICMF 5 category Assay method: APHA 1992, Chapter 24			Verify register/s and record result of each analysis.
c. Coag.positive Staphylococcus/g: N=5 c=2 m=100 M=1000 ICMF 5 category Assay method: FIL 145 : 1990			Verify register/s and record result of each analysis.
d. Salmonella spp / 25 g: N=5 c=0 m=0 ICMF 10 category Assay method: FIL 93A : 1985			Verify register/s and record result of each analysis.
2.5 Chemical contaminants			Verify register/s and record result of each analysis

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Attributes	Compliance		Observations
	YES	NO	
Verify certificates from SENASA, with contaminants tests established by CREHA 2007 Plan and later versions.			
3 Process			
3.1 Harmlessness assurance system:			
a. Verify cleaning schedule and compare with plant registers			Verify registers
b. Verify registers of corrective actions related to SSOPs applied at the plant.			
c. Adequate personnel clothes and general conditions.			Verify register/s and record result.
d. Monitoring registers of defined parameters to be controlled at each CCP (Critical Control Points)			Verify register/s and record result.
e. Monitoring of registers relative to gauging of standards and measuring instruments.			Verify register/s and record result.

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Attributes	Compliance		Observations
	YES	NO	
3.2 Processing			
a. Verify milk controls in milk tank truck.			Verify register/s and record result.
b. Verify that raw milk is processed complying with the steps and conditions defined in the protocol.			Verify register/s.
d. Coagulation:			
1. pH: 6.30 to 6.45. (Parameter to be controlled before coagulation).			Verify register/s and record result of each analysis.
2. Temperature: 31 to 34 °C.			Verify register/s and record result of each analysis.
3. Coagulation time: 12 to 25 minutes.			Verify register/s and record result of each analysis.
e. Curdling:			
1. Grain size: 1 to 3 mm side.			Verify register/s and record result of each analysis.


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Attributes	Compliance		Observations
	YES	NO	
2. Acidity of curdling whey: 6 to 7°D less than milk acidity.			Verify register/s and record result of each analysis.
f. Pressing and molding: pH of paste after pressing: 4.95 – 5.1			Verify register/s and record result of each analysis.
g. Salting: Verify that brines ⁴ comply with protocol specifications.			Verify inputs.
h. Extraction and air drying			
1. Temperature: 10 – 15°C.			Verify register/s and record result of each analysis.
2. Relative humidity in room environment: 84% ± 2			Verify register/s and record result of each analysis.
i. Ageing			


⁴ Daily physicochemical controls and microbiological tests every 15 days must be carried out in order to keep brines within established working levels. Corrective actions must be applied when necessary.

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Attributes	Compliance		Observations
	YES	NO	
1. Minimum time: 8 months (After processing date).			Verify register/s and record result of each analysis.
2. Temperature of room environment: 10 to 15 °C.			Verify register/s and record result of each analysis.
3. Relative humidity of room environment: 84 % ± 2.			Verify register/s and record result of each analysis
4. Cheese turning over: twice a week during 3 months and afterwards once a week until ageing completion.			Verify register/s.
j. Washing, shaping, packing or paraffining or coloring:			
1. Temperature of chamber or refrigerator: 4°C.			Verify register/s.
4. Packaging			
a. Verifying at storeroom of packaging materials declared to be associated to this protocol.			

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Note 1: All analyses must be carried out by laboratories officially authorized for the above mentioned studies, using recognized official methods and calibrated equipment and instruments with their corresponding certificates.

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Conclusions

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Audited company's employees interviewed:-----

On behalf of the auditing company

In agreement, on behalf of audited company

Signature, name and seal

Signature and name

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