

Secretariat of Agriculture, Livestock, Fishing and Food Undersecretariat of Agricultural Policy and Food National Food Administration	QUALITY PROTOCOL	
Code: SAA006	Version: 08	04.20.2007

QUALITY PROTOCOL FOR FRESH BLUEBERRIES

Made official on: May 23, 2007

Resolution SAGPyA Nr 201/2007

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INTRODUCTION

Blueberries are part of the so called "fruits of the woods" or berries. However, they stand out among these fruits because of their hypocaloric, antioxidant, nutritive and medicinal qualities.

They are a perennial crop, and blueberry plants may continue to produce for 30 years. The harvest is carried out generally by hand collecting the fruits one by one when they are ripe.

Blueberries occupy an important place among Argentine exports of fresh fine fruits and this is reflected by the number of hectares that have been planted with these shrubs in our country, in recent years.

1. Scope

This protocol defines and describes the quality attributes that blueberries must have in order to carry the "Argentine Food – A Natural Choice" Seal.

The objective of this document is to provide producers of blueberries in the Argentine Republic with an additional tool for obtaining products with differentiated quality.

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

Producers of blueberries must take into account that compliance with current regulations on Good Manufacturing Practices for the packing room, conditions for fresh fruits and containers is implicit. These regulations are described in the Argentine Food Code – CAA (Chapter I "General provisions" – Resolution GMC Nr 080/96 incorporated to the Code by Resolution MsyAS Nr 587/97; Chapter XI "Vegetable Foods" – Articles 879 to 883; Chapter IV "Tools, Receptacles, Containers, Packaging, Equipment and Accessories").

Likewise, companies must provide evidence of compliance with Argentine labor rules.

2. General criteria

Differentiating attributes for blueberries emerge from the information provided mainly by the Argentine Chamber of Producers of Blueberries and other Berries (CAPAB), and from the cooperation of the Concordia Experimental Farming Station of the INTA.

Requirements compiled for this protocol correspond to the following destination markets: United States of America, European Union and Canada. Likewise, it is

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pointed out that this protocol may be used for products sold in the local as well as in the export market.

3. Grounds for determining differential attributes

Product attributes

These attributes are based on quality requirements from different export markets for Argentine blueberries destined to fresh consumption.

Blueberries must have the characteristics described in this document in order to be considered a differentiated quality product. Fruits are to be preserved from the moment of harvest and must reach the best sanitary and organoleptic conditions of fresh blueberries.

Process attributes

Compliance with Good Agricultural and Harvest Management Practices and implementation of the Hazard Analysis and Critical Control Points (APPCC – HACCP) system in the packing process are required for production and preparation of fresh blueberries, as these are requirements for high quality products in most markets.

On the other hand, storage and transportation conditions must be in agreement with the harmlessness and quality assurance system applied.

Packaging attributes

Complying with current regulations for containers in general, the criterion applied refers to containers preferred by consumers in destination markets. The use of transparent plastic trays is considered the most adequate for this product as they allow the visualization of the contents and ensure fruit care taking into account the fragility of blueberries.

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DIFFERENTIATING PRODUCT ATTRIBUTES

1. Variety

Blueberries may be of any variety in accordance with the characteristics of the genus *Vaccinium corymbosum*.

2. Physical and chemical properties

a) Minimum requirements

Following are the minimum conditions that every unit (fruit) must present:

- well developed
- healthy
- free from strange smells and/or tastes
- adequately ripe in agreement with color, containing sugars and adequate consistency.
- free from spots, wounds or damages
- free from bruises
- free from putrefaction

b) Differentiated quality requirements

- **Ripeness**

Ripeness is determined by:

- Outside color of fruit: it must be the typical color in 100% of the fruit surface. Greenish colors will not be accepted.
 - Sugar content: minimum 7 ° Brix, refractometrically determined.
 - Consistency: fruit firm to the touch (must coincide with color condition).
- **Natural wax:** minimum 90 % of the fruit surface must contain natural wax visually determined.
 - **Blueberries in putrefaction:** less than 1% in tray, visually determined.
 - **Damaged blueberries (crushed, dripping):** less than 2% in tray, visually determined.
 - **Blueberries with scars (due to damages caused by branches or birds, wounds):** less than 4% in tray, visually determined.
 - **Presence of pedicels:** not allowed, visually determined.

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- **Dehydration:** not allowed, visually determined.
- **Fruit size**

Sizes according to maximum equatorial diameter (expressed in mm):

Large	Medium	Small
More than 12	8 to 11	Between 6 and 8

Size tolerance: 3% of fruits of different sizes per tray are accepted.

- **Tolerance in Weight:** +/- 5 % of specified net weight per packaging.
- **Foreign matters:** The presence of foreign matters (dust, leaves, stones, etc) is not accepted.

3. Chemical contaminants:

- **Pesticides:** Not detectable by recognized official methods.

Note: Products used must be authorized for the above mentioned crop by SENASA (See Annex I)

4. Other considerations

- **Product shelf life:** 35 days.

Twenty five days after harvest, fruits begin to evidence softening and putrefaction levels. Therefore, trays authorized to carry the Seal must not exceed 35 days counted from harvest to reception by local or export customers.

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DIFFERENTIATING PROCESS ATTRIBUTES

Primary production

Producers of blueberries that aspire to obtain the "*Argentine Food – A Natural Choice*" Seal must comply with Good Agricultural Practices¹ (including Good Harvest Management Practices).

Harvest

This task must be carried out by skilled labor trained for harvesting quality fruit. Training in good harvest practices must be documented.

Harvest conditions: Harvest must be carried out using the forefinger and the thumb. Fruit must be slightly twisted and then softly pulled without pressing it to avoid damaging or crushing.

As Good Agricultural Practices establish, harvest workers must have short nails, clean hands, must not wear jewels, must wear caps or gathered hair, and must not smoke or drink during process.

It is prohibited to mix loads with fruits picked up from the ground. Only harvesting from plants is accepted.

Farms must have shelters in the field to protect the fruits until the moment they are carried to the packing room.

Any movement or circulation within the farm that might raise dust or other undesired particles must be minimized.

Harvest may be carried out manually and in bulk for later selection of the fruit at the moment of packing. In this case, load heights must be handled so as to avoid crushing. A maximum of 50 cm is recommended.

After harvesting, blueberries must be carried to a clean, fresh, well ventilated place, to avoid exposure to the elements or deterioration caused by sun and dust contamination.

Mishandling during transportation that might damage the fruit must be avoided.

Harmlessness assurance system

Packing plants must comply with the Hazard Analysis and Critical Control Points (APPCC – HACCP) system for this production stage.

Packing

Packing requirements to ensure that fruits last longer after harvesting:

¹ Reference regulations: Resolution SENASA Nr 510/2002, EurepGAP, among others.

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- Do not overload plastic trays (clamshells).
- Trays must never be exposed to sun.
- Blueberries must be cooled as soon as possible after packing.
- During packing the temperature at the packing plant must not exceed 18°C. Otherwise, packing must take place in refrigerated chambers.

1. Transportation and storage characteristics

- **Temperature:** 0 - 1°C, controlled by means of continual temperature monitoring instruments.
- **Humidity:** 90 –95%
- **Place:** free from physical, chemical or microbiological contaminants.

DIFFERENTIATING CONTAINER ATTRIBUTES

- Packing is allowed in biodegradable PET trays, set out in expanded polystyrene molds inside cardboard boxes with inner aluminum foil lining that acts as an outside barrier.
- Protection of boxes with shrink wraps to maintain an optimal storage and transportation temperature (optional).
- Presentation: must be uniform as regards origin, quality and ripeness in each container.
- Packaging materials to protect the product must be new, clean and good quality.

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ANNEX I

Administrative Maximum Residue Limits as provided for by Resolution SAGPyA Nr 1384/2004.

Resolutions SENASA Nr 619/05 and 803/05: Administrative Maximum Residue Limits established in said resolutions are valid until January 5, 2009.

Active principle	MRL (mg/kg)	Resolution SENASA
Boscalid	3.5	Nr 803/05
Azoxystrobin	0.5	Nr 619/05
Captan	3	Nr 619/05
Carbaryl	1	Nr 619/05
Cypermethrin	0.05	Nr 619/05
Cyprodinil	0.02	Nr 619/05
Chlorothalonil	0.01	Nr 619/05
Chlopyrifos	0.05	Nr 619/05
Hydrogen Cyanamide	0.05	Nr 619/05
Diuron	0.1	Nr 619/05
Endosulfan	0.05	Nr 619/05
Ethefon	0.05	Nr 619/05
Fenhexamid	5	Nr 619/05
Fludioxonil	0.05	Nr 619/05
Fosetyl- Al	0.2	Nr 619/05
Glyphosate	0.1	Nr 619/05
Glufosinate Ammonium salt	0.05	Nr 619/05
Copper Hydroxide	20	Nr 619/05
Imidacloprid	0.05	Nr 619/05
Iprodione	10	Nr 619/05

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Linuron	0.05	Nr 619/05
Thiophanate-methyl	1.5	Nr 619/05
Methoxyfenozide	0.5	Nr 619/05
Copper Oxychloride	20	Nr 619/05
Paraquat	0.05	Nr 619/05
Pyraclostrobin	1.3	Nr 619/05
Pirimicarb	0.5	Nr 619/05
Propiconazole	0.05	Nr 619/05
Simazine	0.1	Nr 619/05
Spinosad	0.25	Nr 619/05
Copper Sulfate	20	Nr 619/05
Tebufenocide	0.02	Nr 619/05

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ANNEX II

GLOSSARY

Berry: Fleshy fruit that may have one or more seeds.

Brix Degrees: are equivalent to total sugar and soluble solids contained in liquids of any viscosity level. Measuring by Refractometer.

Injuries: units that present dry wounds or scars whatever the origin, to a degree that sale possibilities are reduced.

Spots: Color alteration on fruit surface: dry wounds or scars whatever the origin.

Strange odor and taste: different from the usual or normal ones in the species. These alterations may be caused by the application of chemical substances to the crop (pesticides, herbicides, fertilizers, etc.) or by the use of containers previously used for other products.

Pedicle: small stem that links the fruit to the plant.

Putrefaction: any damage caused by microorganisms implying any degree of tissue decomposition, disintegration or fermentation.

Branch grazing: (scrape) superficial injury caused by fruit friction against plant structures causing suberification of the epidermis.

Healthy: means that blueberries do not present signs of disease or decomposition preventing or limiting the use of the product.

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Organs and Institutions that participated in the elaboration of this protocol

- National Food Administration - SAGPyA
- Argentine Chamber of Producers of Blueberries and other Berries - CAPAB
- INTA's Concordia Experimental Agriculture Station.

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Code: SAA107	Version: 02	03.26.07

Audit date:

Auditing company:

Audited company:

Location:

Head Office:

Town or City:

Telephone:

Name of company's employee responsible for quality /position:

Product: Fresh blueberries

Reference protocol code: SAA006

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RESULTS

Attributes	Compliance		Observations
	YES	NO	
1. Product Any variety in accordance with the characteristics of the genus <i>Vaccinium corymbosum</i>			
a. Ripeness - Fruit outside color: must be the typical one in 100% of the fruit surface. Greenish colors will not be accepted. - Sugar content: minimum 7 ° Brix. (Refractometrically determined). - Consistency: firm to the touch.			
b. Natural wax: 90% of the fruit surface, as a minimum, must have natural wax (visually determined)			
c. Size: must comply with calibers defined in the protocol. Tolerance: less than 3% per tray with fruits of			

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Attributes	Compliance		Observations
	YES	NO	
different size.			
d. Signs of dehydration: no signs accepted (visually determined)			
e. Presence of pedicels: not allowed (visually determined)			
f. Damaged blueberries: less than 2% on tray (visually determined)			
g. Damage by putrefaction: less than 1% on tray (visually determined)			
h. Blueberries with scars: less than 4% per tray (visually determined).			
i. Tolerance in weight: +/- 5 % of specified net weight per packaging.			
j. Presence of foreign matters: not allowed (visually determined).			

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Attributes	Compliance		Observations
	YES	NO	
k. Chemical contaminants Pesticides: not detectable (analysis of at least 5 of the most commonly used compounds) Methods: GC/MS/MS or LC/MS/MS			
l. Identify harvest date of the stored batch to verify that the shelf life of product does not exceed 35 days.			
2. Process			
A) Harvest: Compliance with Good Agricultural Practices at the farm, including Good Harvest Management Practices.			
a. Forms of harvesting			
b. Conditions of personnel at the moment of harvesting.			

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Attributes	Compliance		Observations
	YES	NO	
c. Transportation conditions.			
d. Protection of harvested product during its permanence in the field.			Specify conditions.
B) Packing			
a- Register of controls of parameters defined for each CCP (Critical Control Point).			
b- Verify that packing temperature does not exceed 18°C, or packing in chambers.			
C) Characteristics of transportation and storage.			
a- Verify that temperature is between 0 and 1°C (controlled by continual temperature monitoring instruments).			
b- Humidity: 90 – 95 %.			
c- Exclusive warehouse for storing the final			

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Attributes	Compliance		Observations
	YES	NO	
product, free from plagues and contaminants.			
3. Packaging			
Verify if packaging complies with protocol provisions.			
Product presentation on tray: uniform as regards origin, quality and ripeness.			

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Conclusions

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

On behalf of the auditing company

In agreement, on behalf of the audited company

Signature, name and seal

Signature and name

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