

# DQCI Services

*Trusted Dairy Laboratory Services  
for more than 50 Years*

## Dairy Instrument Calibration Validation Standards

**DQCI is the Global Leader in the manufacture and sale of Calibration Validation Standards. We offer the broadest range of standards choices in the industry, and continue to lead in the development of new calibration standards for customer applications.**

**Note: Custom Calibration Standards Can Be Developed On Special Request:**

**SEE OUR LIST OF “CUSTOM” CALIBRATION STANDARD EXAMPLES ENCLOSED (page 9)**



*Trust DQCI Calibration Validation Standards To Keep Your Instruments  
Consistently On Target*

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**DQCI**  
Services

Division of  
**Diversified  
Laboratory  
Testing** LLC

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# DQCI Calibration-Validation Standards

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## SECTION I: DQCI Calibration Validation Standards Product Line Items Routinely Manufactured

### Raw Milk Quality Testing

#### Bovine Milk:

**# 110000-Raw Milk Component Calibration-Validation Standards (*1-12 in duplicate*):** Standards for calibrating-validating instruments testing raw milk products. Standard Development Protocol: Raw milk samples are sourced from individual herds that have approximate butterfat range of 2.8% to 5.8% and a protein range of at least 0.6%. Bronopol is added as a preservative. Samples have an expiration date of 21 days from date of manufacture. Laboratory analyses are performed by AOAC procedures. Sample 1 through 6 and 7 through 12 can be used for daily check samples.

**# 113000-Raw Milk Component Calibration-Validation Standards (*1-12 in triplicate*):** These are the same calibration-validation standards as Product # 110000, however they are 12 levels in **triplicate**.

**# 113001-Raw Milk Component Calibration-Validation Standards (*1-12 singles as Additional Sets*):** (Sets shipped to the same location on the same date.) These are the same calibration-validation standard as Product # 110000, however 12 levels are **singles**, and ordered as additional sets to #110000 or #113000.

**# 110005 - "A" Check Sample:** One sample (single vial) of Item ID # 110000 representing a relatively low fat level. May be used as a monitor of the stability of the instrument calibration. Generally available to customers purchasing Item ID # 110000 or 113000. Order is by "each".

**# 110006-"B" Check Sample:** One sample (single vial) of Item ID # 110000, representing a relatively high fat level. May be used as a monitor of the stability of the instrument calibration. Generally available to customers purchasing Item ID # 110000 or 113000. Order is by each.

**# 110303-Raw Milk Standards UNPRESERVED Calibration-Validation Standards:** Same as Item # 110000 except no preservative is added. Must be ordered the week prior to manufacture. Only NDA shipments. Samples shelf life is limited.

**#113302 - Casein Raw Milk Standards (*levels 1-12 in duplicate*):** Standards for calibrating-validating instruments testing raw milk products. Standard Development Protocol: Raw milk samples are sourced from individual herds that have approximate butterfat range of 2.8% to 5.8%, a protein range of at least 0.6%, and a casein range of at least 0.6%, up to 0.8% seasonally. Bronopol is added as a preservative. Samples have an expiration date of 21 days from date of manufacture. Laboratory analyses are performed by AOAC procedures. Sample 1 through 6 and 7 through 12 can be used for daily check samples.

**#113300 - Casein Raw Milk Standards (*levels 1-12 in triplicate*) :** Same as # 113300 but in triplicate

**#113301 - Casein Raw Milk Standards (*levels 1-12 singles as Additional Sets*)**

**#111200 - Raw Milk "Freeze Point" Standards (*20 samples*) :** Each Set consists of 10 samples are made from various sources of normal Raw Milk, and do not have added water, and 10 samples are made from various sources of Raw Milk and will have added water. Water is added to cover a range of 0% to approximately 7%. Freeze point values of these samples will be the result of at least duplicate analysis of each sample. Samples are preserved with bronopol and have a 2 week shelf life from date of manufacture

#### Goat Milk:

**110180-Goat Milk Calibration-Validation Standards: (*12 samples in duplicate*)** Suitable for calibration/validation of instruments testing raw goat milk for fat and protein. Standard Development Protocol: Samples are made from raw goat milk from a goat dairy. Samples are blended to provide a range of fat (approximately 2 %) and protein (0.7% or more). Bronopol is added as a preservative. Shelf life is 14 days from date of manufacture. **Samples must be ordered at least 1 week prior to manufacture.**

## SECTION I: DQCI Calibration Validation Standards Product Line Items Routinely Manufactured

### Raw Milk Quality Testing Continued

#### Bovine SSC

# **110010-ESCC (Electronic Somatic Cell Count) Calibration-Validation Standards (4 in duplicate)** for calibrating electronic cell count instruments. Standard Development Protocol: Raw milk samples from individual sources are used to prepare samples with the following levels of somatic cell counts:

LOW:	<200,000
LOW MEDIUM:	300,000 - 500,000
MEDIUM HIGH:	600,000 - 800,000
HIGH:	900,000 - 1,200,000

Ranges conform to levels required for NCIMS certified laboratories monitoring and reporting somatic cell counts. Bronopol is added as a preservative. Shelf life is 2 weeks from the date of manufacture. Direct Microscopic Somatic Cell counts (field wide single strip method, SMEPD, 17<sup>th</sup> edition). DQCI is an FDA certified somatic cell provider and NCIMS laboratories may use the published somatic cell values to calibrate or validate their electronic somatic cell count instrument.

# **114003-ESCC (Electronic Somatic Cell Count) Calibration-Validation Standards (4 in triplicate):** These are the same calibration-validation standard as Product # 110010, however are 4 levels in **triplicate**.

# **114005-ESCC (Electronic Somatic Cell Count) Calibration-Validation Standards Set of 4 singles:** These are the same calibration-validation standard as Product # 110010, however are 4 levels of one each, but ordered as additional sets.

#### Hourly check samples available upon request

# **110013-ESCC 'Low' daily check sample:** “Low” count sample from Item ID 110010. May be ordered by “each” in addition to an item ID # 110010 or 114003 qualifying order

# **110014-ESCC 'Low-Med' daily check sample:** “Low Medium” count sample from Item ID 110010. May be ordered by “each” in addition to an item ID # 110010 or 114003 qualifying order

# **110015-ESCC 'Med-High' daily check sample:** “Medium High” count sample from Item ID 110010. May be ordered by “each” in addition to an item ID # 110010 or 114003 qualifying order

# **110016-ESCC 'High' daily check sample:** “High” count sample from Item ID 110010. May be ordered by “each” in addition to an item ID # 110010 or 114003 qualifying order

#### Urea (MUN)

# **110090-Urea (MUN) Calibration-Validation Standards: Set of 30 samples in duplicate** for calibration or validation of instruments measuring Milk Urea Nitrogen in milk samples. All samples are raw milk. MUN samples typically have a range of 6-20 mg. /DL. Analysis to determine MUN values is done enzymatically (ChemSpec). To ensure range of values, urea may be added to some samples in the set. Samples expire 14 days after date of manufacture.

## SECTION I: DQCI Calibration Validation Standards Product Line Items Routinely Manufactured

### Raw Skim, Low Fat, and Whey Calibration Standards

**# 110130-Raw Skim Standard:** **One skim sample in duplicate** for validating instruments testing skim milk for fat, protein, and total solids. Analyses are performed by AOAC procedures: Butterfat by Mojonnier; protein by Kjeldahl Method; Total Solids by Oven Method.

**# 110020-Raw Low Fat Non-Fortified Calibration-Validation Standards (1-10 in triplicate):** Standard for calibrating-validating instruments testing raw milk products for butterfat (.10% to 3.5%), protein and solids. Standard Development Protocol: Milk samples are made from comingled milk. Raw samples 1 through 10 are unfortified milk samples. Bronopol is added as a preservative. Samples expire 14 days after date of manufacture. Analyses are performed by AOAC procedures: Butterfat by Mojonnier; protein by Kjeldahl Method; Total Solids by Oven Method

**# 110022-Raw Low Fat Non-Fortified Calibration-Validation Standards - Additional Sets (1-10 in triplicate):** (Sets shipped to the same location on the same date.) These are the same as Product ID # 110020, but ordered as additional sets, and represent a volume discount available when ordered in addition to a Product # 110020 order.

**# 10034-Raw Low Fat Fortified Calibration-Validation Standards (1-14 in duplicate):** Standard for calibrating-validating instruments testing raw milk products for butterfat (.10% to 3.5%), protein and solids. Standard Development Protocol: Milk samples are made from comingled Raw milk. Samples 1 through 10 are unfortified milk samples. Samples 11 through 14 are fortified with condensed skim milk for those laboratories and plants needing solids-non-fat calibration at a higher level (9% to 11% SNF). Bronopol is added as a preservative. Samples expire 14 days after date of manufacture. Analyses are performed by AOAC procedures: Butterfat by Mojonnier; protein by Kjeldahl Method; Total Solids by Oven Method.

**# 110035-Raw Low Fat Fortified Calibration-Validation Standards- Additional Sets (1-14 in duplicate):** (Sets shipped to the same location on the same date.) These are the same as Product ID # 110024, but ordered as additional sets, and represent a volume discount available when ordered in addition to a Product # 110024 order.

**# 110070-Raw Whey Calibration-Validation Standards (1-10 in duplicate):** Ten (10) samples in duplicate, Analyses by AOAC methods, Butterfat by Mojonnier; Protein by Kjeldahl; Lactose by HPLC; and Total Solids by the Oven Method. Bronopol is added as a preservative. Sample shelf life of 14 days from date of manufacture. Whey Standards are manufactured every 2 weeks.  
Application – Cheese Operations: Raw whey evaluation; Fat; Protein; Total Solids and Lactose evaluation.  
Expected Range: Fat: .06% to .60%; Protein: .85% - 1.10%; Lactose: 4.90% - 5.60% Total Solids: 6.60% - 7.90%.

**# 110072-Raw Whey Calibration-Validation Standards - Additional Sets (1-10 in duplicate):** (Sets shipped to the same location on the same date.) These are the same calibration standard as Product # 110070, but ordered as additional sets, representing a volume discount available when ordered in addition to a Product # 110070 order.

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## SECTION I: DQCI Calibration Validation Standards Product Line Items Routinely Manufactured

### Cream and Heavy Milk Calibration Standards

**#110170-Heavy Milk Calibration-Validation Standards (1-10 in duplicate).** Set of 10 samples in duplicate for calibrating/validating instruments test everything from milk to cheese vats that have higher fat, protein and solids than that of normal raw milk. Standard Development Protocol: Samples have a fat range of 3.8 to 5.2% and Total Solids up to 22%. Bronopol is added as a preservative. Shelf life is 14 days from date of manufacture. Analyses are performed by AOAC procedures: Butterfat by Mojonnier; protein by Kjeldahl Method; Total Solids by Oven Method.

**#110172-Heavy Milk Standards – Addtl Sets (1-10 in duplicate)** Sets shipped to the same location on the same date.) These are the same calibration standard as Product # 110170, but ordered as additional sets, and represent a volume discount available when ordered in addition to a Product # 110170 order.

**#110050-Light Cream Calibration-Validation Standards (1-10 in duplicate):** Heat-treated low fat cream to be used for calibrating instruments for butterfat (9.5% to 18%), protein and total solids. Standard Development Protocol: Samples are made every other week from unhomogenized heat-treated cream. Bronopol is added as a preservative. These samples expire 14 days from date of manufacture.

**# 110052-Light Cream Calibration-Validation Standards - Additional Sets (1-10 in duplicate):** (Sets shipped to the same location on the same date.) These are the same as Product # 110050, but ordered as additional sets, and represent a volume discount available when ordered in addition to a Product # 110050 order.

**# 110150-Mid Range Cream Calibration-Validation Standards (1-10 in duplicate):** Heat-treated cream to be used for calibrating instruments for butterfat (20% to 30%), protein and total solids. **(Note: Cat # 110150 & 110152 manufactured quarterly).** Standard Development Protocol: Samples are made quarterly from heat-treated cream. Bronopol is added as a preservative. These samples expire 14 days from date of manufacture.

**# 110152-Mid Range Cream Calibration-Validation Standards- Additional Sets (1-10 in duplicate):** (Sets shipped to the same location on the same date.) These are the same calibration standard as Product # 110150, but ordered as additional sets, and represent a volume discount available when ordered in addition to a Product # 110150 order.

**# 110060- High Cream Calibration-Validation Standards (1-10 in duplicate):** Unhomogenized, heat-treated high fat cream to be used for calibrating-validating instruments for butterfat (32% to 45%), protein and total solids. Standard Development Protocol: Samples are made every week from unhomogenized, heat-treated cream. Only NDA shipments. Bronopol is added as a preservative. Samples expire 14 days after date of manufacture.

**# 110062- High Cream Calibration-Validation Standards - Additional Sets (1-10 in duplicate):** (Sets shipped to the same location on the same date.) These are the same calibration standard as Product # 110060, but ordered as additional sets, and represent a volume discount available when ordered in addition to a Product # 110060 order.

**# 110302-High Cream UNPRESERVED Calibration-Validation Standards: (1-10 in duplicate)** Same product as Item ID # 110060 except no preservative is added. Only “Next Day Arrival” shipments. Samples shelf life is limited. Must be ordered the week prior to manufacture.



## SECTION I: DQCI Calibration Validation Standards Product Line Items Routinely Manufactured

### Condensed Milk Calibration Standards

# **110160-Condensed Whole Calibration-Validation Standards: (1-12 in duplicate)**. Used for instruments testing condensed whole milk. Total solids range is approximately 24% to 34%. Samples are prepared quarterly. Shelf life is 10 days from date of manufacture. Samples should be run upon receipt to ensure best results. Analyses are performed by AOAC procedures: butterfat by Mojonnier, protein by Kjeldahl Method; Total Solids by Oven Method.

# **110162-Condensed Whole Calibration-Validation Standards -Addl sets- (1-12 in duplicate)** (Sets shipped to the same location on the same date.) These are the same calibration standard as Product # 110160, but ordered as additional sets.

# **110040-Condensed Skim Calibration-Validation Standards: (1-12 in duplicate)** Used for calibrating instruments testing condensed skim milk. Standard development protocol: Skim condensed sourced from local production facility, solids level adjusted to provide approximately a total solids range of 19% to 36%. Samples prepared 1X per month. Shelf life is 10 days from date of manufacture. Samples should be run upon receipt to ensure best results. Analyses are performed by AOAC procedures.

# **110042-Condensed Skim Calibration-Validation Standards -Addl sets- (12 samples in duplicate)** as described in product ID # 110040. (Sets shipped to the same location on the same date.) These are the same calibration standard as Product # 110040, but ordered as additional sets, and represent a volume discount available when ordered in addition to a Product # 110040 order.

### Pasteurized-Homogenized Calibration Standards

# **110100-Pasteurized/Homogenized Non Fortified Calibration-Validation Standards (1-10 in triplicate)** : Standard for calibrating-validating instruments testing pasteurized-homogenized milk products for butterfat (.07% to 3.5%), protein and solids. Standard Development Protocol: Samples 1 through 10 are unfortified milk samples. Bronopol is added as a preservative. Samples expire 14 days after date of manufacture. Analyses are performed by AOAC procedures.

# **110102-Pasteurized/Homogenized Non Fortified Calibration-Validation Standards - Additional Sets (1-10 in triplicate)** (Sets shipped to the same location on the same date.) These are the same calibration standard as Product # 110100, but ordered as additional sets, and represent a volume discount available when ordered in addition to a Product # 110100 order.

# **110301-Pasteurized/Homogenized UNPRESERVED Non Fortified Calibration-Validation Standards (1-10 in triplicate)**: Same product as Item ID # 110100 except no preservative is added. Only NDA shipments. Samples shelf life is limited. Must be ordered the week prior to manufacture.

# **110114-Pasteurized/Homogenized Fortified Calibration-Validation Standards (1-14 in duplicate)**: Standard for calibrating-validating instruments testing pasteurized-homogenized milk products for butterfat (.07% to 3.5%), protein and solids. Standard Development Protocol: Samples 1 through 10 are unfortified milk samples. Samples 11 through 14 are fortified with condensed skim milk for those laboratories and plants needing solids-non-fat calibration at a higher level (9% to 11%SNF). Bronopol is added as a preservative. Samples expire 14 days after date of manufacture. Analyses are performed by AOAC procedures: Butterfat by Mojonnier; protein by Kjeldahl Method; Total Solids by Oven Method.

# **110115-Pasteurized/Homogenized Fortified Calibration-Validation Standards - Additional Sets (1-14 in duplicate)**: (Sets shipped to the same location on the same date.) These are the same calibration standard as Product # 110114, but ordered as additional sets, and represent a volume discount available when ordered in addition to a Product # 110114 order.

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**#110300-California Pasteurized Calibration-Validation Standards: (10 samples, 4 vials each level)**

For production facilities or laboratories testing fluid milk conforming to California product standards. Standard Development Protocol: Pasteurized, homogenized milk is obtained from California bottlers, and samples are prepared with a fat range of 0.07 to 3.5% fat. Bronopol is added as a preservative. Shelf life is 14 days from date of manufacture. Analyses are performed by AOAC procedures: Butterfat by Mojonnier; Solids Non Fat; Total Solids by Oven Method.

**Next Page:**

**Examples of "Custom" DQCI Instrument Calibration -Validation Standards**

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## SECTION II: Examples of "**Custom**" DQCI Instrument Calibration -Validation Standards

(DQCI works with your specific product/ingredients to develop a  
custom calibration standard – Call DQCI)

### Chocolate Drinks

- 1% Chocolate Milk Calibration-Validation Standards
- Whole Chocolate Milk Calibration-Validation Standards

### Eggnogs

- Light Eggnog Calibration-Validation Standards
- Regular Eggnog Calibration-Validation Standards
- Premium Eggnog Calibration-Validation Standards

### Ice Cream Mixes

- 10% White Ice Cream Mix Calibration-Validation Standards
- 12% White Ice Cream Mix Calibration-Validation Standards
- 14% White Ice Cream Mix Calibration-Validation Standards
- 10% Chocolate Ice Cream Mix Calibration-Validation Standards
- 12% Chocolate Ice Cream Mix Calibration-Validation Standards
- Vanilla Soft Serve and Shake Mix
- Chocolate Soft Serve and Shake Mix
- Chocolate Malt
- Sherbet Calibration-Validation Standards

### Cottage Cheese Dressings

- Fat Free Cottage Cheese Dressing Calibration-Validation Standards
- 2% Cottage Cheese Dressing Calibration-Validation Standards
- 4% Cottage Cheese Dressing Calibration-Validation Standards

### Other

- Flavored Milks Calibration-Validation Standards
- Non-Dairy Creamer Calibration-Validation Standards
- Sour Cream Mix Calibration-Validation Standards
- Buttermilk (non-cultured) Calibration-Validation Standards
- Half and Half Ultra-Pasteurized Calibration-Validation Standards
- **Vat Milk** Mix (including cheese) Calibration-Validation Standards
- **Retentate** Calibration-Validation Standards
- **Permeate** Calibration-Validation Standards
- **Casein** Calibration-Validation Standards

### Other Custom Calibrations Considered Upon Request

**If you have a need to validate a current process, or create a new calibration please contact DQCI Technical Services and DQCI will be happy to advise and assist you whenever technically possible.**

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## Examples of Available Chemistry Analyses

**Cheese Sample Analysis:** Fat, Moisture, pH and Salt content

**Vitamin A&D Milks Fortification Analysis:** by HPLC

**Whey Testing (and other dairy):** Fat (Mojonnier), Fat Dry Basis, Protein (Kjeldahl), Total Solids, Salt Wet Basis, Salt Dry Basis, pH, Ash, Casein, Lactose, (and if requested Total Plate Count , Yeast & Mold, Coliforms, E. coli, Thermophiles, other spoilage or pathogen organisms)

**Casein (Kjeldahl):** Singles, duplicates or triplicates: Casein determination utilizing “SMEDP” 17th edition\* .

**Total Protein: (Kjeldahl) -** Singles, duplicates, triplicates: Total (crude) protein is provided by Kjeldahl determination, which measures the total nitrogen content in a sample utilizing “SMEDP” 17th edition\* .

**True Protein:** Singles or duplicates: Total nitrogen protein and non protein nitrogen equivalent in a dairy sample are determined using the Kjeldahl method, the True Protein analysis is completed utilizing the indirect method described in “SMEDP” 17th edition\* .

**Combination Protein, Casein, True Protein, Singles or duplicates:** This is a series of tests. Indirect Kjeldahl method of casein determination in a sample, utilizing “SMEDP” 17th edition”. Total nitrogen protein and non protein nitrogen equivalent in a dairy sample are determined using the Kjeldahl method, and the True Protein analysis is completed utilizing the indirect method described in “SMEDP” 17th edition\* .

**Fat (Mojonnier):** Singles, duplicates or triplicates: Determination of Fat content in a dairy sample utilizing “SMEDP” 17th edition\* .

**Fat (Babcock - Cream, Cheese):** Singles or duplicates: Fat determination test applicable to unhomogenized cream and cheese utilizing “SMEDP” 17th edition\* .

**Lactose:** Singles or duplicates: Determination of lactose content in a dairy sample by HPLC, sample utilizing “SMEDP” 17th edition\* .“

**Total Solids:** Singles, duplicates or triplicates: utilizing “SMEDP” 17th edition\* .

**Ash Test:** A test that virtually eliminates the presence of organic matter, leaving primarily minerals, utilizing Association of Analytical Chemists Method 945.46

**Titrateable Acidity:** utilizing “SMEDP” 17th edition\* .

**Lactic Acid Analysis:** Analysis of the amount of lactose in a dairy sample converted to lactic acid by microbial or culture activity. The D/L forms (Dextro/Levo) are generally separated. The determination of L lactic acid aids in determining potential lactic acid crystal formation in aged or processed cheese

**Phosphatase Test (Charm):** Determination if phosphatase enzyme has been deactivated by proper pasteurization processing. Charm phosphatase test is recognized as official (NCIMS) test for Grade A dairy products.

- SMEDP = “Standard Methods for the Examination of Dairy Products”

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## Cheese Test Package

*Routine Testing, Specials, or Custom Projects*  
*1 sample or 100's per week*

**Cheese Samples are analyzed for  
 Fat, Moisture, pH and Salt content.**

**Fat** :Babcock method

**Salt**: chloride analyzer

**pH**: pH instrument, and

**Moisture**: vacuum oven

*Certificates of Analysis*  
 issued on request

**Attractive Package Prices**  
 (volume discounts available)

**Cheese Fortification Testing**  
 Vitamin D by HPLC

## Whey Testing

*Routine Testing, Specials, or Custom Projects*

*Fat(Mojonnier)      Fat Dry Basis*

*Protein(Kjehldahl)      Total Solids*

*Salt Wet Basis      Salt Dry Basis*

*pH      Ash*

*Casein      Lactose*

*Total Plate Count      Yeast Mold*

*Coliforms      E. coli*

*Others per request*

**Custom Vat Milk Calibration -Validation Standards can be developed, call for information.**



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## Other Analyses

**Standard Plate Count (SPC):** Aerobic plate count of total colony forming units of bacteria per milliliter or gram of raw, processed liquid and dry dairy products utilizing “SMEDP” 17th edition.

**Coliform Colony Forming Unit (CFU) Test:** Agar plate method employing a media (VRB) optimizing the growth of coliform organisms

**Yeast and Mold Plate Analysis:** Determination of yeast and mold cell forming colonies in a dairy sample under specified conditions utilizing “SMEDP” 17th edition.

**Salmonella (AOAC RF):** Test for rapid recovery of *Salmonella* in food, allowing detection and presumptive identification of the salmonella organism

**Listeria: (AOAC RF):** Test for detection and presumptive identification of the listeria organism

**E-Coli:** VRB-MUG Agar plate test

**E-Coli 0157:H7:** (AOAC Official Method) for identification and presumptive identification of E Coli H157:H7

**Enterobacteriaceae:** Differentiation of Enterobacteriaceae (eg. Klebsiella, E Coli, Salmonella, Shigella)

**CP Staph:** Baird-Parker agar-BAM approved for food

**Calcium Analysis:** Atomic Absorption analysis for calcium concentration in an original sample is reported.

**Phosphorus Analysis:** Atomic Absorption analysis for phosphorus concentration in an original sample is reported.

**Potassium Analysis:** Atomic Absorption analysis for potassium concentration in an original sample is reported

**Magnesium:** Atomic Absorption analysis for magnesium concentration in an original sample is reported

**Manganese:** Atomic Absorption analysis for manganese concentration in an original sample is reported

**Iron:** Atomic Absorption analysis for Iron concentration in an original sample is reported

**Zinc:** Atomic Absorption analysis for zinc concentration in an original sample is reported

**Sorbic Acid:** Analysis of concentration of allowable preservative in a sample dairy product or food product

**(Other Tests Available, call for information)**



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