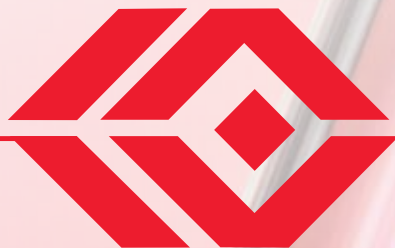


N · PAL
N · P ANALYTICAL
LABORATORIES



Chemistry & Microbiology Testing Services
For The Food & Feed Industries

www.NPAL.com





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NP ANALYTICAL LABORATORIES provides complete product and ingredient testing services. Whether you are developing a nutrient label, monitoring ingredient quality, evaluating new product concepts, or verifying product safety, our experienced staff of chemists and microbiologists work with you to provide the reliable information you need.

Our methods are rigorously tested and, whenever possible, are based on internationally recognized protocols. The quality of your data is assured through comprehensive staff training, laboratory audits, and proficiency testing. While reliability is critical, we understand that your deadlines are important and our staff will work with you to keep your project on track.

NPAL looks forward to working with you soon.

Contact us at: **800-423-6832** or **314-982-1310**

or by e-mail at: **NPAL@purina.nestle.com**

or visit our web site at: **www.NPAL.com**



BASIC FOOD AND INGREDIENT COMPOSITION

NPAL draws on 100 years of testing experience, applying up-to-date technology, and proven test methods. From Kjeldahl protein, to the latest dietary fiber tests, to complex fatty acid characterization, NPAL can meet your needs quickly and economically. We work closely with you to select appropriate tests and help understand test results.

PROTEIN, MOISTURE, FAT, ASH

Ash	\$ 12
Crude fat, acid hydrolysis	\$ 30
Crude fat, alkaline hydrolysis	\$ 30
Crude fat, soxhlet	\$ 21
Fat, total by GC	\$150
Moisture, air oven	\$ 10
Moisture, Karl Fisher	\$ 30
Moisture, vacuum oven	\$ 12
Protein (Kjeldahl or Combustion)	\$ 15

See **FAT COMPOSITION AND FAT QUALITY** on page 8 for additional test methods for characterizing fats.

FIBER, STARCH

Beta-glucan	\$ 65
Carbohydrates, total by calculation ²	No charge
Fiber, acid detergent	\$ 30
Fiber, crude	\$ 18
Fiber, dietary soluble & insoluble	\$150
Fiber, neutral detergent	\$ 30
Fiber, total dietary	\$110
Fructans, total	\$ 80
Lignin, 72% H ₂ SO ₄	\$ 30
Lignin, permanganate	\$ 30
Protein, acid detergent	\$ 30
Starch, enzymatic (total & gelatinized)	\$ 65

See **CARBOHYDRATES AND SWEETENERS** on page 9 for additional carbohydrate tests.

NOTES:

² Carbohydrates and calories by calculation provided at no charge when a sample is tested for protein, fat, moisture and ash.

PROTEIN QUALITY

Ammonia, free	\$ 20
Nitrogen solubility index ¹	\$ 30
Nitrogen, total	\$ 15
Non-protein nitrogen, protein equivalent	\$ 20
Pepsin digestibility	\$ 45
Protein dispersibility index ¹	\$ 32
Protein solubility, 0.2% KOH	\$ 38
Urea	\$ 20

See **AMINO ACIDS AND PROTEIN QUALITY** on page 7 for additional protein quality tests.

NOTES:

¹ Requires total protein assay.

MICROSCOPY AND BULK PROPERTIES

Bushel weight	\$ 15
Calories by calculation ²	No charge
Calories, bomb calorimetry	\$ 35
Screen, Alpine or Brinkman	\$ 20



MINERALS, METALS, ELECTROLYTES

Both instrumental and chemical methods are employed to measure minerals and metals in ingredients and finished products. For determination of several minerals and metals in a sample, ICP techniques may be more economical than traditional AA methods. Heavy metal screens and specific tests are offered as well as specific tests for nitrites, nitrates, sulfites, and chloride.

Aluminum	\$ 21	Mineral screen by ICP ¹	\$120
Antimony	\$ 21	Molybdenum	\$ 21
Arsenic	\$ 38	Nickel	\$ 21
Ash	\$ 12	Nitrate	\$ 32
Barium	\$ 21	Nitrite	\$ 32
Bismuth	\$ 21	Phosphorous	\$ 30
Cadmium	\$ 38	Potassium	\$ 21
Calcium	\$ 21	Salt, soluble	\$ 21
Chloride, soluble	\$ 21	Scandium	\$ 21
Chromium	\$ 21	Selenium	\$ 38
Cobalt	\$ 21	Silicon	\$ 60
Copper	\$ 21	Silver	\$ 21
Fluoride	\$ 60	Sodium	\$ 21
ICP Minerals ¹	\$120	Strontium	\$ 21
Iodine	\$ 75	Sulfite	\$150
Iron	\$ 21	Sulfur	\$ 70
Lead	\$ 38	Tin	\$ 21
Lithium	\$ 21	Titanium	\$ 60
Magnesium	\$ 21	Vanadium	\$ 21
Manganese	\$ 21	Zinc	\$ 21
Mercury	\$ 50		

NOTES:

¹ Minerals by ICP includes calcium, phosphorous, sodium, potassium, magnesium, iron, copper, zinc, and manganese by ICP. Other minerals and metals are available on request. Please call for more information.



VITAMINS

Accurate vitamin testing requires experienced analysts using carefully selected techniques. NPAL uses proven chromatographic separations, microbiological methods and spectroscopic techniques that are selected to meet customer requirements.

Ascorbic acid (Vitamin C)	\$ 55	Vitamin A (retinol and esters)	\$ 85
Biotin	\$ 90	Vitamin B1 (thiamine)	\$ 60
Calcium pantothenate	\$ 85	Vitamin B2 (riboflavin)	\$ 60
Choline, enzymatic	\$ 65	Vitamin B3 (niacin)	\$ 65
Cyanocobalamin (Vitamin B12)	\$ 90	Vitamin B5 (pantothenic acid)	\$ 85
Folate, total	\$ 90	Vitamin B6 (pyridoxine)	\$ 90
Niacin (Vitamin B3)	\$ 65	Vitamin B12 (cyanocobalamin)	\$ 90
Pantothenic acid (Vitamin B5)	\$ 85	Vitamin C (ascorbic acid)	\$ 55
Pyridoxine (Vitamin B6)	\$ 90	Vitamin C polyphosphate	\$ 70
Retinol (Vitamin A) and esters	\$ 85	Vitamin D in food and feed	\$250
Riboflavin (Vitamin B2)	\$ 60	Vitamins D2 and D3 in food and feed	\$310
Thiamine (Vitamin B1)	\$ 60	Vitamin E	\$ 85
Tocopherol acetate (Vitamin E)	\$ 85		
Tocopherols (free alcohols)	\$ 90		



AMINO ACIDS AND PROTEIN QUALITY

NPAL maintains a specialized laboratory focused on the precise determination of amino acids for assessment of nutritional quality, fermentation studies, flavor research, and other applications. Optimum precision is obtained by measuring essential amino acids using rigorous classical sample preparation methods combined with dedicated amino acid analyzers. These techniques add to the cost of amino acid determinations, but our research shows that they provide the most reliable results. Specialized techniques are employed to obtain high sensitivity or achieve critical separations when traditional methods are not appropriate.

AMINO ACIDS IN PROTEINS AND PEPTIDES

Acid stable amino acids ¹	\$145
Cysteine and methionine by oxidation ²	\$145
Tryptophan	\$ 90
Combined package (includes acid stable, sulfur amino acids, and tryptophan)	\$315

INDIVIDUAL AMINO ACIDS IN PROTEINS AND PEPTIDES

Hydroxyproline	\$110
Lysine (from protein)	\$110
Lysine and Methionine (from protein)	\$110
Methionine (from protein)	\$110
Taurine	\$110

Other individual amino acids available on request.

NON-PROTEIN OR ADDED AMINO ACIDS

Acid stable amino acids, free	\$125
Basic amino acids by HPLC ³	\$110
Cysteine, free	\$105
Glutamate (including MSG)	\$105
Lysine, free	\$100
Lysine and methionine, free	\$100
Methionine, free	\$100

Other individual free amino acids available on request.

PROTEIN QUALITY ASSAYS

Nitrogen solubility index ⁴	\$ 30
Non-protein nitrogen, protein equivalent	\$ 20
Pepsin digestibility ⁴	\$ 45
Protein dispersibility index ⁴	\$ 32
Protein solubility, 0.2% KOH	\$ 38
Trypsin inhibitor	\$100
Urease Activity (in soybean meal)	\$ 20

NOTES:

¹ Acid stable amino acids include aspartic acid, threonine, glutamic acid, proline, glycine, alanine, valine, methionine, serine, leucine, isoleucine, tyrosine, phenylalanine, histidine, lysine, and arginine. Samples are hydrolyzed with hydrochloric acid under vacuum in sealed glass vessels. Amino acids are determined by ion exchange chromatography with ninhydrin detection using dedicated amino acid analyzers.

² Due to the instability of cysteine and methionine, sulfur amino acids are measured by first oxidizing the sample with performic acid to form stable oxides of cysteine and methionine. The sample is then hydrolyzed with hydrochloric acid followed by determination of cysteic acid and methionine sulfone as described in Note 1.

³ Includes glutamine, asparagine, γ -aminobutyric acid, and α -aminobutyric acid as free amino acids.

⁴ Requires total protein assay.



FAT COMPOSITION AND FAT QUALITY

Fat composition and fat quality impact both nutritional value and quality in food and feed. NPAL measures more than 50 individual fatty acids to determine fatty acid profiles, total fat, and fat composition. Customized reports are offered to meet specific customer needs including trans fat, saturated fat, unsaturated fat, and omega-3 and omega-6 fatty acids. A variety of fat quality tests are offered to determine stability and quality of ingredients and finished products.

FAT COMPOSITION

Arachidonic acid ⁵	\$130
Cholesterol	\$100
Conjugated linoleic acids	\$130
Crude fat, acid hydrolysis	\$ 30
Crude fat, alkaline hydrolysis	\$ 30
Crude fat in meats	\$ 21
Crude fat, soxhlet	\$ 21
Fat:	
total by GC ¹	\$130
add fatty acid profile ²	\$160
Fatty acid profile	\$160
Glycerol	\$ 90
Linoleic acid ⁵	\$130
Trans fat ⁵	\$130

FAT QUALITY TESTS

FAC Color (in fats)	\$ 30
Free fatty acids, total, in fat	\$ 20
Free fatty acids, total, extracted fat ⁴	\$ 30
Hexanal by headspace GC	\$ 70
Insolubles (in fats)	\$ 21
Iodine number (in fats)	\$ 55
Moisture, Karl Fisher (in fats and oils)	\$ 30
Oxidative stability index (OSI)	\$ 70
Peroxide value (food, feed, ingredients) ⁴	\$ 30
Peroxide value (in fats)	\$ 24
TBA (thiobarbituric acid) number	\$ 50
Titrateable acidity:	
as free fatty acids in fats	\$ 20
as free fatty acids in food, feed, and ingredients ⁴	\$ 30
Total fatty acids by titration (in fats)	\$ 75
Unsaponifiables (in fats)	\$ 50

NOTES:

- ¹ The standard report includes total fat, saturated fat, monounsaturated fat, polyunsaturated fat, and trans fat. Other values may be reported on request.
- ² Price applies only when requested in combination with total fat by GC.
- ³ Includes total fat by GC at no additional cost.
- ⁴ Available only for samples containing sufficient extractable fat.



CARBOHYDRATES AND SWEETENERS

HPLC, enzymatic, and gravimetric tests are used to characterize a wide range of carbohydrates from simple sugars to starches and dietary fiber.

Beta-glucan	\$ 65	Sorbitol	\$ 75
Brix	\$ 25	Starch, enzymatic (total and gelatinized)	\$ 65
Fiber, total dietary	\$110	Sugar profile ¹	\$ 80
Fiber, soluble and insoluble dietary fiber	\$150	Sugar profile ¹ with raffinose and stachyose	\$150
Fiber, acid detergent	\$ 30		
Fiber, neutral detergent	\$ 30		
Fructans, total	\$ 80		

NOTES:

¹ Includes fructose, glucose, sucrose, lactose, maltose. If sugar alcohols are present, additional charges may apply due to additional testing required to separate sugars and sugar alcohols.

PRESERVATIVES

Available water	\$ 25	pH	\$ 17
Benzoic acid	\$ 80	Propylene glycol	\$ 80
BHA and BHT	\$ 90	Salt, soluble	\$ 21
Ethoxyquin	\$ 85	Sorbic acid	\$ 80
Fumaric acid	\$175	Sulfite	\$150
Nitrate	\$ 32	Tocopherols (free alcohols)	\$ 90
Nitrite	\$ 32	Total titratable acidity of foods	\$ 25
Propionic acid	\$ 75	Volatile organic acids ¹	\$ 85

NOTES:

¹ Includes C₂-C₇ organic acids.

PESTICIDES AND TOXINS

PESTICIDES

Organophosphates and chlorinated pesticides and PCBs	\$220
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MYCOTOXINS

Aflatoxins, ELISA screen	\$ 50
Deoxynivalenol, ELISA screen	\$ 50
Fumonisin, HPLC	\$105



MICROBIOLOGY

Microbiology testing is crucial to verifying the safety and quality of food, feed, and ingredients. NPAL offers a wide range of pathogen tests to help assure product safety and tests for spoilage and indicator organisms to monitor product quality. Microbial shelf life and challenge studies are offered to help evaluate the stability of new and reformulated products.



Aerobic plate count	\$ 13
Anaerobic bacterial spore MPN	\$ 42
Anaerobic plate count	\$ 19
Available water (water activity)	\$ 23
Bacillus cereus count	\$ 39
Bacillus cereus MPN ¹	\$ 72
Clostridium perfringens ¹	\$ 42
Coliform count (VRBA)	\$ 18
Coliform MPN	\$ 17
Coliform (3M Petrifilm)	\$ 14
E. coli MPN ¹	\$ 17
E. coli (3M Petrifilm)	\$ 14
Enterobacteriaceae	\$ 18
Enterobacteriaceae (3M Petrifilm)	\$ 18
Enterococci / fecal streptococci count	\$ 20
Fecal coliform MPN	\$ 17
Lactobacilli count	\$ 19
Listeria species (VIDAS)	\$ 30
Listeria monocytogenes ¹	\$ 34
Mesophilic aerobic spore count	\$ 32
Mesophilic anaerobic spore MPN	\$ 42

Microbial challenge study	Inquire
Microbial shelf-life study	Inquire
Osmophilic yeast count	\$ 30
Psychrotrophic plate count	\$ 23
Salmonella per 25g ¹	\$ 26
Salmonella per 375g ¹	\$ 34
Salmonella MPN	Inquire
Salmonella complete serological ID	\$165
Staphylococcus aureus count	\$ 22
Staphylococcus aureus MPN ¹	\$ 38
Thermophilic aerobic plate count	\$ 19
Thermophilic aerobic and flat sour spores	\$ 37
Thermophilic anaerobic spores H ₂ S negative	\$ 37
Thermophilic anaerobic spores H ₂ S positive	\$ 41
Total plate count (aerobic)	\$ 13
Water activity (available water)	\$ 23
Yeast and mold count	\$ 16

NOTES:

¹ Additional cost to confirm pathogens.

MISCELLANEOUS

Available water (water activity)	\$ 25
Brix	\$ 25
Bushel weight	\$ 15
Caffeine	\$ 80
Hexanal by headspace GC	\$ 70
Isoflavone profile	\$ 90
Isoflavones AOAC saponification method	\$ 90

Non-volatile organic acids ²	\$175
pH	\$ 17
Phytic acid, ion exchange	\$ 70
Screen, Alpine or Brinkman	\$ 20
Trypsin inhibitor	\$100
Volatile organic acids ¹	\$ 85

¹ Includes C₂-C₇ organic acids.

² Includes pyruvic, lactic, oxalic, malonic, methylmalonic, fumaric, and succinic. Other organic acids available on request.

SAMPLE HANDLING FEE OF \$6.00 PER SAMPLE

A sample preparation fee is added to each sample submitted for testing.

Proper sampling and sample preparation is critical to the success of any analytical method. Care should be taken to obtain samples for submission that are large enough to be representative of the product or ingredient you want tested. Once the sample is received, it will be evaluated to determine the appropriate method to prepare a homogeneous subsample suitable for testing. Our sample preparation laboratory utilizes a variety of laboratory mills, meat grinders, food choppers, freeze dryers, and other devices appropriate to handle a wide range of sample types.

Sample handling	\$ 6
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Freeze dry	Inquire
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NUTRITION LABEL TESTING

NPAL can provide a complete testing program designed to meet your nutrition labeling requirements. At no additional cost, results are calculated based on serving size including calculations for calories, carbohydrates, and RDI. Please contact us for more information.





QUALITY PROGRAM

NPAL maintains a comprehensive quality program including:

- Qualified personnel
- Validated test methods
- Proficiency sample programs
- Automated sample tracking
- Long-term record retention
- Independent Quality Unit

Qualified personnel undergo frequent training on food chemistry and microbiology, new test procedures, instrumentation, and customer service.

Test methods are based, where possible, on validated procedures published by the Association of Official Analytical Chemists, the American Oil Chemists Society, the American Association of Cereal Chemists and other appropriate organizations.

Performance of these methods is monitored by regularly analyzing a reference sample containing a known analyte concentration. NPAL participates in numerous proficiency sample programs and collaborative studies organized by independent organizations.

All samples submitted to NPAL are tracked by a computer based Laboratory Information Management System. Unique numbers are assigned to all samples submitted. Sample descriptions, customer names, and requested tests are monitored by the system to ensure complete and timely response to customer requests.

Raw data, associated reference sample results, instrument performance checks, and other records associated with all samples are retained for five (5) years. Records are stored according to written protocols and are accessible for review.

An independent Quality Unit oversees all aspects of the Quality Program. The Quality Unit reviews test protocols, evaluates check sample results, and conducts independent audits.

STANDARD TERMS AND CONDITIONS

SAMPLE RETENTION

Samples submitted for analysis will be retained for thirty (30) days after the results have been reported. Sample retention may be affected by the stability of the sample or the quantity of sample submitted for testing. You may make specific arrangements for extended sample retention prior to or at the time of sample submission. Such extended storage may result in additional charges.

QUALITY ASSURANCE AND DOCUMENTATION

All services provided by NPAL will be performed in accordance with the NPAL Quality Assurance Program. The customer must notify NPAL of specific documentation requirements prior to the start of any services.

RAW DATA

Raw data, associated reference sample results, instrument performance checks, and other records associated with all samples are retained for five (5) years. Records are stored according to written protocols. You may request copies of pertinent raw data. There may be additional costs associated with extended storage and copies of raw data, duplicate reports, or other special reporting requirements.

PRIVACY

Customer privacy is of utmost importance to NPAL and that is why all services, analyses, and reports are provided to you, the customer on a confidential basis. No references to the services, the analyses, the results, NPAL or Nestlé Purina PetCare in any form of advertising, news release, or other public announcement will be made without prior written authorization.

WARRANTY

NPAL will perform the services, within the limits prescribed by the customer, in a manner consistent with the level of care and skill ordinarily exercised by analytical laboratories currently practicing under similar conditions and circumstances and performing similar services. **ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE OR WARRANTY OF MERCHANTABILITY, ARE EXCLUDED.**

LIMITATION OF LIABILITY

By using the data from analyses performed by NPAL, customer acknowledges that the total liability of NPAL, its directors, officers, agents or employees to customer arising out of, or in connection with, the services performed shall not exceed the invoiced amount for said services. The foregoing shall apply, notwithstanding any provision to the contrary in any customer purchase order or other order for work issued.

PAYMENT

Payment terms are net 30 days from the invoice date. A service charge of 1.5% per month may be added to any unpaid balances.



HOW TO SUBMIT SAMPLES

SAMPLES SHOULD BE SHIPPED TO THE FOLLOWING ADDRESS:

NP Analytical Laboratories
c/o Sample Entry
824 Gratiot
St. Louis, MO 63102

PLEASE PROVIDE THE FOLLOWING INFORMATION:

A sample submission form (included at the end of this brochure):

- Description of the Sample
- Tests Requested
- Name, Address, Phone and E-mail for Reporting
- Billing Address
- Purchase Order Number (if available)

SPECIAL INSTRUCTIONS FOR SHIPPING PERISHABLE ITEM

Before shipping perishable or frozen samples, please call us in advance so that we can expedite delivery of the samples to ensure their integrity. Samples should be shipped in suitable containers and packed to maintain perishable items at an appropriate temperature. Shipments should be scheduled to arrive at NPAL during regular business hours unless specific arrangements have been made in advance.

NOTE:

A sample handling fee of \$6.00 will be added to the cost of each sample submitted.

FOR ADDITIONAL INFORMATION:

Contact us at: **800-423-6832** or **314-982-1310**

or by e-mail at: **npal@purina.nestle.com**

or visit our web site at: **www.NPAL.com**

**SAMPLE SUBMISSION FORMS AND QUOTE REQUESTS MAY BE COMPLETED
ONLINE BY VISITING OUR WEB SITE**

www.NPAL.com



SUBMITTER INFORMATION:

Company Name: _____
Address: _____

Contact Name: _____
E-mail: _____
Phone: _____

BILLING INFORMATION:

Check if same as submitter

Company Name: _____
Address: _____

Contact Name: _____
E-mail: _____
Phone: _____
P.O. Number: _____

Additional Results Recipients:

Name: _____
E-mail: _____
Name: _____
E-mail: _____

PREFERRED METHOD TO RECEIVE REPORTS:

- E-MAIL ONLY E-MAIL & MAIL
 MAIL ONLY

Sample ID	Sample Description	Analysis Requested	Expected Levels (if available)

SPECIAL INSTRUCTIONS:

Please contact us to discuss priority service requests prior to shipping samples. Additional charges may apply for priority service. Samples requested "ASAP" will be entered for normal service time.

Special instructions for shipping perishable items: Before shipping perishable or frozen samples, please call us so that we can expedite delivery of the samples to ensure their integrity. Samples should be shipped in suitable containers and packed to maintain perishable items at an appropriate temperature. Shipments should be scheduled to arrive at NPAL during regular business hours unless specific arrangements are made in advance.

www.NPAL.com

When
Experience Counts,
Count On **NPAL**

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800-423-6832