

Louisiana State University AgCenter

Louisiana Department of Agriculture and
Forestry

Agricultural Chemistry Laboratory

Reference Methods

Unit Conversions

Feed/Pet food	
Analysis	Reference method
Protein	AOAC Method 990.03
Crude Fat (feed)	AOAC Methods 2003.05 and 2003.06
Total Fat (pet food)	Operator's Manual for ANKOM HCl Hydrolysis System AOCS Standard Procedure Am 5-04
Crude Fiber	AOCS approved Ba6a-05
Acid Detergent Fiber	Acid Detergent Fiber (ADF Method 12) in Feeds - Filter Bag Technique (for A2000 and A2000I) by ANKOM
Ash	AOAC Method 942.05
Mineral ICP Group 1 (B, Ca, Cu, Fe, Mg, Mn, P, K, Na, S, Zn)	EPA Method 200.7 AOAC Method 985.01 EPA Method 3052
Mineral ICP Group 2 (Al, Ba, Cd, Cr, Co, Pb, Mo, Ni, Se, As)	EPA Method 200.7 AOAC Method 985.01 EPA Method 3052
Aflatoxin	AOAC Method 994.08 - Modified
Fumonisin	8830 - Veratox for Fumonisin
Salt/NaCl	AOAC Methods 935.47 and 941.18 USDA FSIS Analytical Chemistry Laboratory Guidebook: Food Chemistry. (To determine salt content in meat and poultry samples manually refer to the Volhard method SLT, Pages SLT-1: SLT-8, May 1993)
Chloride	AOAC Methods 935.47 and 941.18 USDA FSIS Analytical Chemistry Laboratory Guidebook: Food Chemistry. (To determine salt content in meat and poultry samples manually refer to the Volhard method SLT, Pages SLT-1: SLT-8, May 1993)
Mercury	EPA Method 7473
Nitrate (as NO ₃) in hay sample	EPA Method 351.2 (Colorimetric, semi-automated block digester, AAll)
Moisture	AOAC Method 934.01
Yttrium	EPA Method 200.7, AOAC Method 985.01, EPA Method 3052

Lime	
Analysis	Reference method
CCE	AOAC Method 955.01
Sieve Size	ASTM Method C136/136M
pH	Methods of Soil Analysis: Chapter 12 Soil pH and Lime Requirement
Mercury	EPA Method 7473
Alternative Lime Registration Set	CCE, Moisture, Sieve, ICP 1+2, Total Salts, pH
Miscellaneous	
Analysis	Reference method
Gentamicin	Micro Determination of Gentamicin in Serum by High-Performance Liquid Chromatography with Ultraviolet Detection. J of Chromatography, 182 (1980) 201-210
Total Soluble Salts (alternative lime)	Methods of Soil Analysis: Chapter 10 Soluble Salts - Modified See Chloride
Soil	
Analysis	Reference method
Nitrogen TKN	AOAC Method 976.06
Mineral ICP Group 1 (B, Ca, Cu, Fe, Mg, Mn, P, K, Na, S, Zn)	EPA Method 200.7, AOAC Method 985.01, EPA Method 3052
Mineral ICP Group 2 (Al, Ba, Cd, Cr, Co, Pb, Mo, Ni, Se, As)	EPA Method 200.7, AOAC Method 985.01, EPA Method 3052
Mercury	EPA Method 7473
pH	Methods of Soil Analysis: Chapter 12 Soil pH and Lime Requirement
Total Solids	See Moisture
Nitrate (Nitrogen as NO ₃ -N)	EPA Method 351.2, Total Nitrogen in Fertilizers by Technicon, Industrial Method No. 560-79A Methods of Soil Analysis, Part 2 Nitrogen-Inorganic, EPA Method 353.2
Nitrite (Nitrogen as NO ₂ -N)	EPA Method 353.2
Ammonia (Nitrogen NH ₃ -N)	EPA Method 351.2, Total Nitrogen in Fertilizers by Technicon, Industrial Method No. 560-79A Methods of Soil Analysis, Part 2 Nitrogen-Inorganic

Fertilizer	
Analysis	Reference method
Chicken Litter	N, P, K in %
Chicken Litter with Moisture	N, P, K in % + Moisture
Nitrogen	AOAC Method 993.13
Phosphorous	AOAC Method 978.01
Potassium	AOAC Method 971.01
Moisture	AOAC Method 930.15
Mineral ICP Group 1 (B, Ca, Cu, Fe, Mg, Mn, Na, S, Zn)	EPA Method 200.7, AOAC Method 985.01, EPA Method 3052
Mineral ICP Group 2 (Al, Ba, Cd, Cr, Co, Pb, Mo, Ni, Se, As)	EPA Method 200.7, AOAC Method 985.01, EPA Method 3052
Nitrate (as Nitrogen)	EPA Method 351.2, Total Nitrogen in Fertilizers by Technicon, Industrial Method No. 560-79A Methods of Soil Analysis, Part 2 Nitrogen-Inorganic
Ammonia (as Nitrogen)	EPA Method 351.2, Total Nitrogen in Fertilizers by Technicon, Industrial Method No. 560-79A Methods of Soil Analysis, Part 2 Nitrogen-Inorganic
Food	
Analysis	Reference method
Protein	AOAC Method 981.10 and AOAC 990.03
Crude Fat	AOAC Methods 2003.05 and 2003.06
Crude Fat (Meat and Meat Products)	AOAC Method 991.36
Crude Fiber	AOCS approved Ba6a-05
Salt	AOAC Methods 935.47 and 941.18 USDA FSIS Analytical Chemistry Laboratory Guidebook: Food Chemistry. (To determine salt content in meat and poultry samples manually refer to the Volhard method SLT, Pages SLT-1: SLT-8, May 1993)
Water Activity	Operator's Manual Version 2.0 for AquaLab Series 3 AquaLab Series 3 Quick Start.

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Water	
Analysis	Reference method
Nitrogen TKN	EPA Method 351.2 (Colorimetric, semi-automated block digester, AAll) AOAC Method 976.06
Total Phosphorous (<ppm)	EPA method 365.2 and 365.3
Dissolved Phosphorous	EPA method 365.2 and 365.3
Lagoon Water	N, P, K in ppm
Mineral ICP Group 1 (B, Ca, Cu, Fe, Mg, Mn, P, K, Na, S, Zn)	EPA Method 200.7, AOAC Method 985.01, EPA Method 3052
Mineral ICP Group 2 (Al, Ba, Cd, Cr, Co, Pb, Mo, Ni, Se, As)	EPA Method 200.7, AOAC Method 985.01, EPA Method 3052
Mercury	EPA Method 7473
Total Solids	EPA Method 160.3
Suspended Solids	EPA Method 160.2 Standard Methods for the Examination of Water and Wastewater, 14th Ed., Page 92, Method 208B (1975)
Dissolved Solids	EPA Method 160.1
Volatile Solids	EPA Method 160.4
Nitrate (Nitrogen as NO ₃ -N)	SM4500-NO ₃ -H, EPA Method 351.2, Total Nitrogen in Fertilizers by Technicon, Industrial Method No. 560-79A Methods of Soil Analysis, Part 2 Nitrogen-Inorganic EPA Method 353.2 Technicon AutoAnalyzer II manual 1971.
Nitrite (Nitrogen as NO ₂ -N)	SM4500-NO ₃ -H, EPA Method 353.2, Technicon AutoAnalyzer II manual 1971.
Ammonia (Nitrogen NH ₃ -N)	EPA Method 351.2 Total Nitrogen in Fertilizers by Technicon, Industrial Method No. 560-79A Methods of Soil Analysis, Part 2 Nitrogen-Inorganic
Alkalinity	AOAC Method 973.43 EPA Method 310.1 Metrohm 907
Turbidity	EPA Method 180.1
Conductivity	SM 2510B ASTM D1125 EPA Method 120.1
Salinity	"Wooster et al. 1969, Redefinition of Salinity" See Chloride
pH	EPA Method 150.1, EPA Method 150.2
Anions (F,Cl,Br,NO ₂ ,NO ₃ ,SO ₄ ,PO ₄)	EPA Method 300.0
Microbiology	
Analysis	Reference method
Listeria monocytogenes	MLG Method 8.11
E. coli O157:H7/STEC	MLG Methos 5C.00 and 5B.05
Salmonella	MLG Method 4.10

UNIT CONVERSIONS

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How to convert percent (%) to parts per million (ppm) to parts per billion (ppb)

Percent: $1/100 = 1\%$

Parts per million: $1/1000000 = 1\text{ppm}$

Parts per billion: $1/1000000000 = 1\text{ppb}$

$1\% = 10,000\text{ppm} = 10,000,000\text{ppb}$

Example:

$0.123\% = 1,230\text{ppm} = 1,230,000\text{ppb}$

Common units that can be associated with ppm and ppb

$1\text{mg/kg} = 1\text{ppm}$

$1\mu\text{g/g} = 1\text{ppm}$

$1\text{ng/mg} = 1\text{ppm}$

$1\text{mg/L} = 1\text{ppm}$

$1\mu\text{g/mL} = 1\text{ppm}$

$1\text{ng}/\mu\text{L} = 1\text{ppm}$

$1\mu\text{g/kg} = 1\text{ppb}$

$1\text{ng/g} = 1\text{ppb}$

$1\mu\text{g/L} = 1\text{ppb}$

$1\text{ng/mL} = 1\text{ppb}$