



Enzyme Activity Unit Definitions

• Used by PhytoCeutical Formulations •

Note: The activity of PhytoCeutical Formulations' nZymax™ are measured and expressed in Food Chemical Codex (FCC) units whenever these official published standards are available.

Amylase (DU) “Dextrinizing unit” -- One FCC alpha-amylase Dextrinizing Unit (DU) is defined as the quantity of alpha-amylase that will dextrinize soluble starch in the presence of an excess of beta-amylase at the rate of one gram per hour at 30°C. The assay is based on the time required for an alpha-amylase to hydrolyze a limit dextrin substrate to a defined blue value. The degree of hydrolysis is determined by comparing the blue value of the hydrolyzed limit dextrin substrate with that of a color standard.

Alpha-Galactosidase (GalU) “alpha-Galactosidase unit” -- One FCC Galactosidase activity unit (GalU) is defined as the quantity of enzyme that will liberate p-nitrophenol at the rate of 1 µmol/minute under the conditions of the assay. The assay is based on a 15-minute hydrolysis of p-nitrophenyl- α -D-galactopyranoside followed by spectrophotometric measurement of the liberated 4-nitrophenol.

Pectinase (endo-PGU) “Endo Polygalacturonidase Unit”-- Currently, there is not a published FCC unit for pectinase. The lab at our vendor standardizes pectinase based on endo-PGU. One endo-PG unit is defined as the amount of enzyme that decreases 50% of substrate viscosity per minute at pH 3.5 and 40°C.

Lactase (ALU) “Acid Lactase unit” -- One FCC Acid Lactase Unit (ALU) is defined as the quantity of enzyme that will liberate one micromole of *o*-nitrophenol per minute at 37°C and a pH of 4.5. It is based on a 15 -minute hydrolysis of an *o*-nitrophenol-beta-Dgalactopyranoside substrate.

Glucoamylase "AGU# “Amyloglucosidase unit” -- FCC Amyloglucosidase Units "AGU# are defined as the amount of glucoamylase "amyloglucosidase# that will liberate 0.1 µmol/min of p-nitrophenol from p-nitrophenol-alpha-glucopyromoside at pH 4.3 and 50°C.

Phytase (FTU) “Phytase Unit”-- One FCC FTU is defined as that quantity of enzyme that will liberate inorganic phosphate at one micromole per minute from sodium phytate based on a 30-minute hydrolysis of sodium phytate at 37° C and pH 5.5.



Malt Diastase (DP°) “Diastatic Power unit” -- One FCC unit of diastase activity, expressed as degrees Diastatic Power (DP°), is defined as the amount of enzyme that will produce sufficient reducing sugars from a standard starch substrate to reduce 5mL of Fehling’s solution per conditions of the assay. The assay is based on a 30-min. hydrolysis of a starch substrate at pH 4.6 and 20 degrees C. The reducing sugar groups produced during the reaction are measured in a titrimetric procedure using alkaline ferricyanide. This enzyme assay measures the activity of both alpha- and beta-amylases present in a given sample.

Cellulase (CU) “Cellulase unit” -- One FCC Cellulase Unit (CU) is that activity that will produce a relative fluidity change of one in five minutes in a defined carboxymethyl cellulose substrate under the conditions of the assay. This assay is based on the enzymatic hydrolysis of the interior beta-1,4-glucosidic bonds of a defined carboxymethyl cellulose substrate at pH 4.5 and 40°C. The corresponding reduction in substrate viscosity is determined with a calibrated viscometer.

Bromelain (PU) “Papain unit” -- The activity of bromelain is measured in the FCC PU; the assay of which is based on the hydrolysis of casein. This assay is based on a 60-minute proteolytic hydrolysis of a casein substrate at pH 6.0 and 40°C. One PU (Papain Unit) is defined as that quantity of enzyme that liberates the equivalent of 1µg of tyrosine per hour under the conditions of the assay.

Protease (HUT) “Hemoglobin unit on a Tyrosine basis” -- The activity of many protease enzymes is measured in the FCC HUT. This assay is based upon the hydrolysis of denatured hemoglobin. One FCC HUT unit of proteolytic (protease) activity is defined as that amount of enzyme that produces, in one minute under the specified conditions, a hydrolysate whose absorbance at 275nm is the same as that of a solution containing 1.10 g per mL of tyrosine in 0.006N hydrochloric acid.

Papain (PU) “Papain unit” -- The activity of the papain is measured in the FCC PU; the assay of which is based on the hydrolysis of casein. This assay is based on a 60-minute proteolytic hydrolysis of a casein substrate at pH6.0 and 40°C. One PU (Papain Unit) is defined as that quantity of enzyme that liberates the equivalent of 1µg of tyrosine per hour under the conditions of the assay.

Lipase (FCCLU) “Food Chemical Codex Lipase unit” -- One FCC Lipase Unit (LU) is defined as that quantity of enzyme that will liberate the equivalent of one µmol of acid (H+) per minute from the substrate, under the conditions of the assay. The assay is based on a five- minute hydrolysis of an olive oil substrate at pH 6.5 and 30°C. The fatty acids released on hydrolysis of the glycerol esters are determined by titration with sodium hydroxide.