

Complete chemical reference chart

Primary Drive Levels	Pain, Need for Pleasure (nfp), Hunger, Coldness, Hotness, Tiredness, Sleepiness, Loneliness, Crowded, Fear, Boredom, Anger, Sex Drive, Injury, Suffocation, Thirst, Stress —Primary Drive Levels. These chemicals show the state of any given drive inside a creature. The higher the concentration, the more need there is for a creature to perform an action to reduce it.
Drive-raising chemicals	Each of the primary drives has a drive-raising chemical. These are shown as the drive name with the word “increase” after. For example, “Hunger increase”. Special chemical reactions called “drive raisers” convert drive-raising chemicals into their corresponding drive over time.
Drive reducing chemicals	Primary drives also have drive reducing chemicals. These are shown as the drive name with the word “decrease” after. For example, “hunger decrease”. Chemical reactions called “drive reducers” react them with their corresponding drive over time.
Reward	Part of the learning system and is used to reinforce an action. Generated by drive-reducing chemicals reacting with drives. Positive actions performed by creatures produce some reward chemical. This process is controlled genetically.
Punishment	Used to punish an action. Generated by the presence of drive raiser chemicals. Negative actions performed by creatures produce some punishment chemical. This process is controlled genetically.
Reinforcement	Both punishment and reward decay to produce this short-lived chemical. It allows the concept neurones of the brain to strengthen their links when any kind of reinforcement takes place.
ConAsh, DecAsh1 and DecAsh2	Concept layer and Decision layer atrophy suppressing hormone. These hormones are used to ensure a fresh supply of dendrites (neural links) for new concepts learnt.
Reward Echo and Punish Echo	These are side effect chemicals of the reward and punishment chemicals decaying. These are generated because punishment and reward decay rapidly, making it difficult to view their activity. These two “echo” chemicals last longer and can therefore be used to view the learning process.
Lactate	The product of anaerobic (oxygen free) respiration. Lactate is converted back into pyruvate when oxygen becomes available again.
Pyruvate	The breakdown product of glucose, an energy intermediate involved in the production of ATP.
Fatty acid	An intermediate in fat digestion. It is used to make cholesterol, and hence the steroid hormones such as testosterone and oestrogen.
Triglyceride	An intermediate in fat metabolism, made up of three fatty acids, it takes six to make one unit of adipose tissue.
Fat	A high energy foodstuff of Albia. It is broken down into fatty acids in the Norn’s stomach, and stored as adipose tissue.
Adipose tissue	A long-term high energy reserve in creatures – Norn bodyfat. Too much bodyfat can cause heart disease in Norns.
Muscle tissue	Used to store amino acids, and to determine how much ATP a Norn uses.
Amino acid	The building block of protein and muscle tissue. Amino acid can be

	converted into glucose, so acts as another energy reserve.
Protein	A foodstuff made up of amino acids. This is the only source of amino acids for Norns, other than breaking down their own muscle tissue.
Life	Chemical to control creature ageing. This decays over time switching on receptors in the brain that move the creature's stage of life further forward. These receptors also allow new genes to switch on. This chemical starts high and decays to nothing after about 10-12 hours.
Starch	Starch is a primary foodstuff in Albia. It is injected into creatures when they eat and is converted to glucose over time with chemical reactions.
Glucose	Creature energy source. This is produced from starch, from a reversible reaction from glycogen, or from fatty acids. Glucose is used by creatures during muscle movement and when fighting some infections.
Glycogen	A short term energy reserve, responsive to adrenaline. It is produced in a reversible reaction from glucose. When a creature's glucose level gets low, spare glycogen is converted back into glucose.
Dissolved carbon dioxide	Carbon Dioxide in water—produced by muscle action. It is broken down into carbon dioxide (which is exhaled) and water, in the lungs. It is a waste product that is a useful indicator of energy consumption.
Urea	A non-toxic nitrogenous waste product
Ammonia	A toxic nitrogenous waste product produced from the conversion of amino acids to glucose, in a process called gluconeogenesis.
Oxygen	This is used in the heart to oxidise pyruvate and produce energy.
Air	Breathed in by the lungs, air is broken down into oxygen
Water	Water is produced as a by-product of the oxidation of pyruvate, as dissolved carbon dioxide.
Energy	Produced by oxidising pyruvate, and used to create ATP from ADP.
ATP	The fuel used to drive all the organs and processes in a creature. If the ATP level ever drops to zero, the creature becomes unconscious, and its organs start taking damage.
ADP	When ATP is 'burnt' or used up in driving a process, it is converted into ADP. The ADP is then converted back into ATP using energy. The amount of ATP plus ADP is therefore constant.
Myoglobin	This molecule can carry a number of oxygen molecules, transporting them through the bloodstream.
Oxymyoglobin	Myoglobin with oxygen attached. This acts as a small store of oxygen, which means that creatures can survive for a short while without air.
Bilin	This is a signal molecule, used to regulate the production of bile acid.
Hexokinase	Enzyme produced during muscle action. In creatures this is used to break down glucose into waste products.
Oestrogen	Hormone that controls fertility cycle in females. When Oestrogen reaches a certain level, a female will be fertile and can be fertilised if a male mates with her. An absence of Oestrogen indicates a female that cannot breed either because she is too young, or too old.
Testosterone	Hormone that controls fertility in males.

Gonadotrophin	Produced immediately when a female becomes pregnant. This hormone is used to suppress the female ovulation cycle.
Progesterone	This is produced progressively throughout pregnancy. When it reaches a certain level, a receptor fires and an egg is laid.
Inhibin	A signal molecule used to regulate production of testosterone.
LH	Luteinising hormone, signals ovulation.
FSH	Follicular stimulating hormone controls oestrogen production.
Steroidone	A signal molecule used to regulate production of cholesterol.
Cholesterol	A vital molecule used in the production of hormones such as oestrogen and testosterone.
Arousal potential	Creatures produce this when fertile, signalling their readiness to mate.
Mating pheromone	Produced from species pheromone and mating pheromone, signals an appropriate mate is in the area.
Species pheromone	This signal molecule indicates a creature of the same species is near
Parent pheromone	This signal molecule indicates a creature's parent is near
Child pheromone	This signal molecule indicates a creature's child is near
Sibling pheromone	This signal molecule indicates a creature's sibling is near
Opposite sex pheromone	This signal molecule indicates a creature of the opposite sex is near
Norn smell	This signal molecule indicates a Norn is near
Grendel smell	This signal molecule indicates a Grendel is near
Ettin smell	This signal molecule indicates an Ettin is near
Heavy metals	A toxin that is produced by radiation in the environment and damages the bones.
Cyanide	This toxin destroys energy so that ATP cannot be made. It will make a creature unconscious very quickly, and it will then die, unless treated.
Belladonna	Produced by some plants, this deadly poison permanently can stop the heart.
Geddonase	This toxin liquefies adipose tissue, producing a small amount of glucose. A Norn will have to eat a great deal to recover from this poisoning.
Glycotoxin	A deadly toxin in Albia. This chemical breaks down glycogen, a potentially fatal reaction should it continue unchecked.
Fullness	This feeling is produced when a creature has food in its stomach, and it negates the feeling of hunger. If it is produced inappropriately the creature will have no appetite.
Vitamin E	This vitamin is essential to keep the reproductive system healthy.
Vitamin C	This vitamin is essential to keep the immune system healthy.
Bile acid	A digestive enzyme, produced from cholesterol in the liver.
Insulin	This is used to signal when the creature has been fed, and should be storing food in its fat reserves.
Glycogen synthase	This enzyme converts glucose to glycogen, and is the means to regulate glycogen level.

Dehydrogenase	An enzyme produced in order to convert alcohol to glucose.
Prostaglandin	This molecule is produced by the bones in response to injury, and helps organs to speed their healing process.
EDTA	Ethylene diamine tetraacetic acid is a chelating agent which rids a creature of heavy metals, saving it from heavy metal poisoning.
Sodium thiosulphite	This compound destroys cyanide, preventing cyanide poisoning. It has to be administered quickly
Arnica	The extract of the wild arnica flower is capable of curing glycotoxin poisoning.
Tyrosine	An essential amino acid, with neurotransmitter properties.
Triptophan	An essential amino acid, with neurotransmitter properties.
Alcohol	Found in some fermented fruit, alcohol gets creatures drunk, and is broken down into glucose
Dancing	Purple Mountain Norn music inebriation
Adrenaline	Natural adrenaline level builds up due to stress from excessive boredom, anger and so forth. Adrenaline has various detrimental effects on a Norn's life.
Activase	Generated by muscle activity.
Turnase	Generated by being cornered, converts fear to anger .
Collapsease	Generated by retreating, converts anger to fear.
Phosphoglycerokinase	An enzyme involved in ATP metabolism, which regulates the flux through the energy metabolism pathway to prevent wastage.
Protease	An enzyme which breaks down muscle tissue, to regulate the amount of muscle tissue in a creature.
Histamine A	Irritant that causes sneezing. Histamine A is most often produced as a result of a bacterial infection. A sneezing Norn is a very infectious Norn if she is near others!
Histamine B	Irritant causing coughing rather than sneezing.
Sleep Toxin	A toxin that cancels the effect of sleeping, by converting sleepiness decrease to sleepiness.
Fever Toxin	Toxin that produces a fever, elevating body temperature and energy requirements. This is as a result of bacterial infection.
Antibodies	There are eight antibody types. These are generated in response to infections, and latch onto certain types of bacteria and destroy them over time.
Antigens	Antigens are present on infecting bacteria. The immune system is stimulated to start antibody production for any antigens detected.