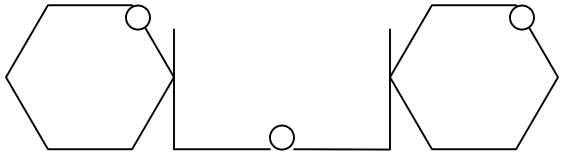
The Importance of Carbohydrates in Avian Nutrition

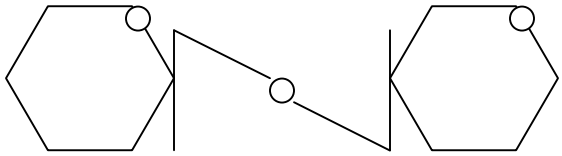
By Debra McDonald

Carbohydrates include sugars, starches and fibre. They contain glycosidic bonds that are designated α (alpha) or β (beta), depending on their chemical configuration. While α bonds can be broken by digestive enzymes, β bonds require the action of microbial enzymes and these are generally classified as fibre.

Carbohydrates are essential in the diet. While muscles can utilise fatty acids for energy, the central nervous system utilizes carbohydrates as a source of energy. Diets low in carbohydrates may result in carbohydrate-containing amino acids (the building blocks of protein) being shunted away from growth and production to be used for glucose synthesis.



α-(1,4)



β-(1,4)

Chemical bonds of carbohydrates

Chitin

Chitin is the principal polysaccharide of cell walls of fungi and the primary constituent of the exoskeleton of crabs, lobsters and insects. It is very similar in structure to cellulose fibre but contains an additional nitrogen group. Measurements of crude protein (which evaluate total nitrogen in a food) can overestimate protein availability for birds as the nitrogen group can only be separated from the carbohydrate component if the bird possesses *chitinase* enzymes. Chitinases have been identified in starlings, raptors and a variety of seabirds (predominantly birds that feed on invertebrates), are low in chickens and absent in African grey parrots and pigeons.