

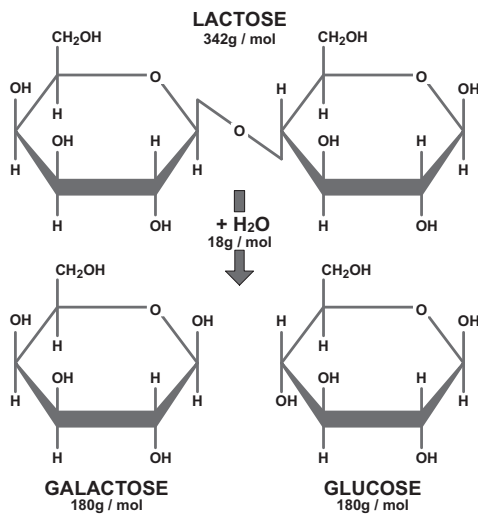
in the processing of cheese of the Cheddar type:

- Accelerated acidification and rennet coagulation, thus time for curd preparation and treatment as well as post-treatment of freshly formed cheese is reduced by 15...20%
- Increased manufacturing capacity, as dry matter content increases slightly during vacuum deaeration
- Uniformly closed cheese mass and improved aroma, in total a quality stabilisation and optimisation (WALDNER 1965, further KRETSCHMANN and TABATSCHNIKOW).

However, vacuum degassing is hardly used, as costs make it prohibitive despite its advantages. FLÜELER and PUHAN could not improve coagulation properties after reducing CO<sub>2</sub>-content of rennet-delayed milk by vacuum deaeration.

### 2.2.2.3.3 Lactase treatment

Lactase (=  $\beta$ -Galactosidase) is a lactose-hydrolysing enzyme, and is available in the market as *Lactozym* and *Maxilact*. Lactose is a disaccharide, which forms equal parts of glucose and galactose (monosaccharide) after hydrolysis (Fig.2.42)



In general, lactose is fermented slower than hydrolysed lactose. Acidification and coagulation time can be shortened by a lactase treatment of cheese milk. Lactase stimulates growth of streptococci and proteolytic-reacting bacteria (EL-SAFETY et al.). Addition of  $\beta$ -galactosidase to cheese milk before renneting stimulates fusion of proteins and formation of a homogeneous structure of submicelles (EL-ZAYAT). Proteolytic decomposition of cheese is improved; specifically content of free amino acids and fatty acids is increased as well as peptides (GOODA et al.).

Fig. 2.42 Lactose hydrolysis

Ripening time is visibly reduced and therefore advantageous for the production of hard and semi-soft (sliced) cheese. During manufacture of soft cheese (Camembert), hydrolysis leads to pleasant and supple texture. It is not getting soft in the outer zones, and liquefies only at an overripe stage (GRIMM). With increasing hydrolysis, pH-value increases slightly in the outer zones; at the centre of the soft cheese it increases significantly. A fast ripening does have an effect on characteristic properties of standard types of cheese (Camembert and others), non-standard types with corresponding properties are less affected, and shelf life is significantly less, as shown in Camembert (Tab. 2.35).

Tab. 2.35 Shelf life of Camembert 45% fat in dry matter at 10 °C in function of lactose hydrolysis (KAMMERLEHNER and KESSLER)

Lactose hydrolysis	0%	40%	80%
Shelf life – days	14	12	11
Consumption – days	22	18	15