2.3.1.1.3 Application of rennet varieties

Milk coagulation enzymes are characterised by their ratio:

Milk coagulation activity : proteolytic effect

The higher this ratio, the more proteolytic activity is present during milk coagulation. Within alternative coagulants, this ratio increases for chicken pepsin < pig pepsin < sheep pepsin < bovine pepsin < calves chymosin. Microbial coagulation enzymes have the following sequence: Endothia parasitica Protease < Mucor miehei Protease < Mucor pusillus Protease < calves chymosin. A high milk coagulation activity of pure chymosin, animal-based or genetically engineered, always leads to a stable gel and a high firmness of curd.

Non-specific milk coagulation enzymes have adverse effects in predefined cheese technologies and varieties of cheese (Fig.2.47).

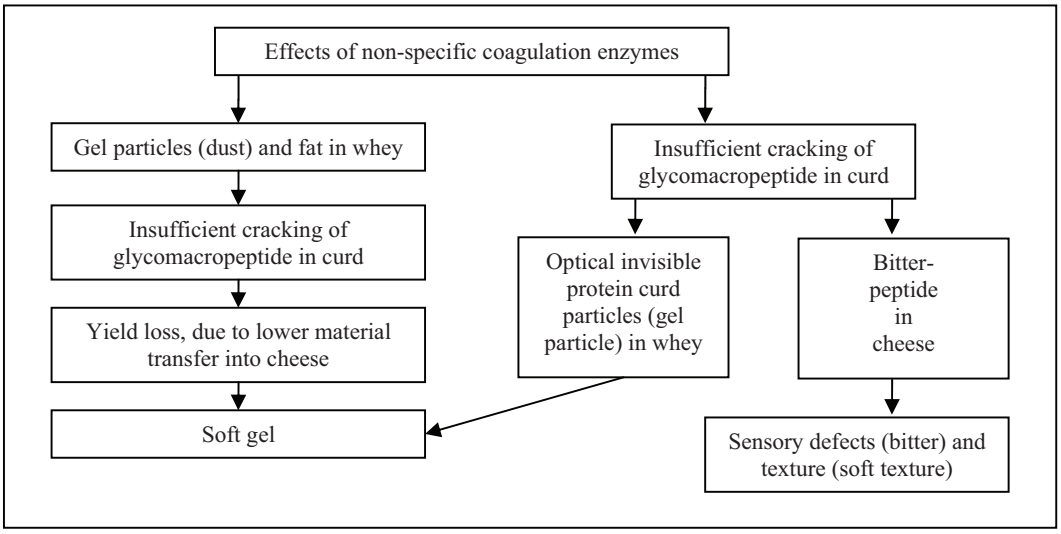

Fig. 2.47 *Disadvantages of using non-specific milk coagulation enzymes (mod. acc. to REINER)*

2.3.1.2 Ripening enzymes

Many trials were made (and are still being made) in order to shorten cheese ripening (aging) and to improve aroma. Former activity lowers production costs; latter activity can improve cheese quality and thus increase margins. Currently, known ripening enzymes cannot accelerate all biochemical processes in a harmonious way. *Lipases* are enzymes with lipolytic activity. *Plasmin,* a proteinase, decomposes protein. In cheese dairies, only approved ripening enzymes can be used.

2.3.1.2.1 Lipase

Milk contains native lipoprotein lipase. Furthermore, some organisms can generate lipase in milk and cheese. These are mainly *Bacillus-* and *Pseudomonas varieties* (mainly *Pseudomonas fluorescens)* producing phospholipase in milk, which does not occur there as such. Lipase causes a lipolysis of milk, resulting in some derivative products of milk fat such as free fatty acids, mono- and diglycerides as well as glycerine. Free fatty acids in cheese lead to a piquant aroma.