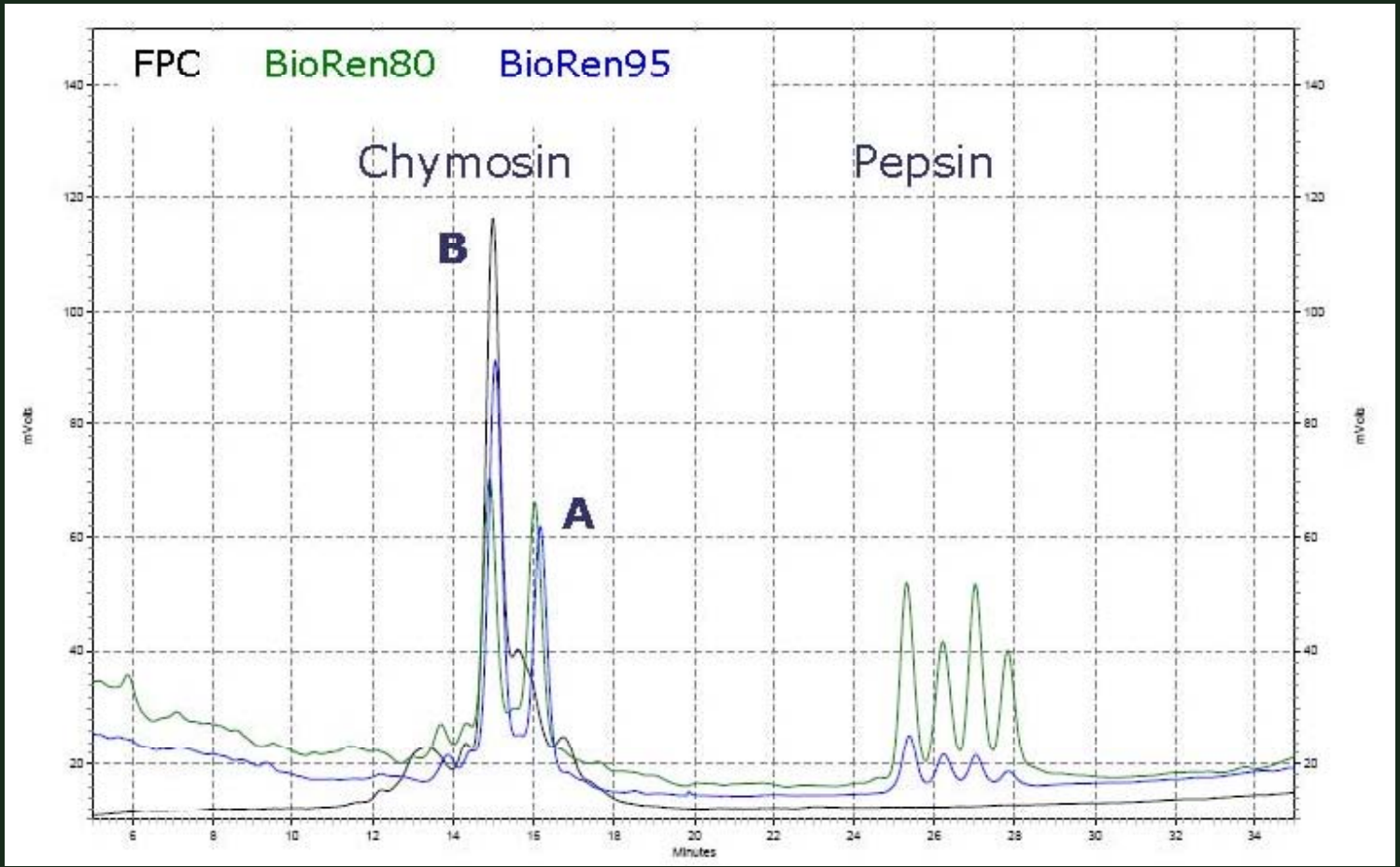
What is natural rennet?

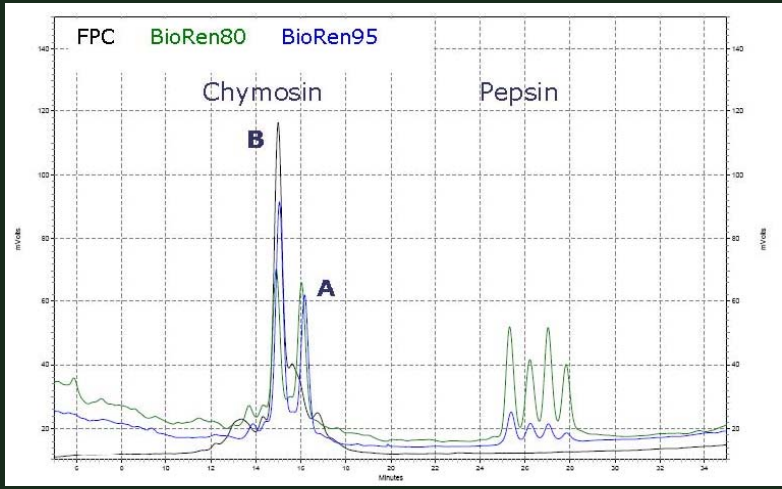
natural rennet

- is a cocktail of digestion enzymes produced in the stomach's mucosa of mammals like calf, goat or sheep
- is developed and adapted by nature over millions of years
- is the ideal enzyme combination for the cheese-making process
- brings best development of flavour and taste into the cheese
- brings highest possible yield because of ideal gel-formation during coagulation

natural rennet



natural rennet



This graph shows the results of HPLC analysis of different coagulants – FPC, Hundsbichler Natural Rennet with 80% Chymosin content and Hundsbichler Natural Rennet with 95% Chymosin content.

The small peak left before the Chymosin B is the Chymosin C.

FPC products have only one peak for one type of Chymosin whereas Natural Rennet always offers the complete range of all Chymosin types plus a smaller or bigger amount of the natural Pepsin which also consists of more than one enzyme type.

natural rennet

- rennet is extracted out of the mucosa of the fourth stomach of young ruminants
- the younger the animal (calf, kid-goat, lamb), the higher is the content of un-denatured chymosin
- no animal is ever killed for the stomach – the stomachs are a by-product of the meat production
- there is not residual meat or similar products in natural rennet because it is filtered and specially purified

natural rennet

- as we are using a mixture of milks from many genotypes of cows it is important to use a mixture of all parts of chymosin and pepsin of many genotypes of calves too
- as nature is not wasting anything, there is a reason for each different enzyme-fraction in the stomach
- using a chromatographic enzyme purification not only allows to use “old cows chymosin” but also leads to significant losses of essential parts of the rennet
- this is why we are using an ultra filtration system for concentration of the enzymes instead of a chromatographic concentration system

the secrets of natural rennet

- natural rennet contains all types of chymosin – main-type A, B and C and all known sub-types
- as there are different casein types in the milk, only the variety of natural chymosin (A, B and C) covers all these different casein offers
- Chymosin cleaves the κ-casein, exactly between the amino acids 105 and 106 and this guarantees minimum losses in the whey and a perfect gel-formation
- pure chymosin coagulation delivers some delays in coagulation time if the pH and the composition of the milk varies from season to season – some percentage of natural pepsin are suitable to compensate this delay

the secrets behind rennet substitutes

- **Microbial enzymes cleave the κ-casein on many positions. The gel-formation is different. There are more losses of casein and less retention of fat, minerals and vitamins in the curd. Therefore microbial rennet brings less yield in the production and a higher unspecific proteolysis (bitter-peptides) in maturation.**

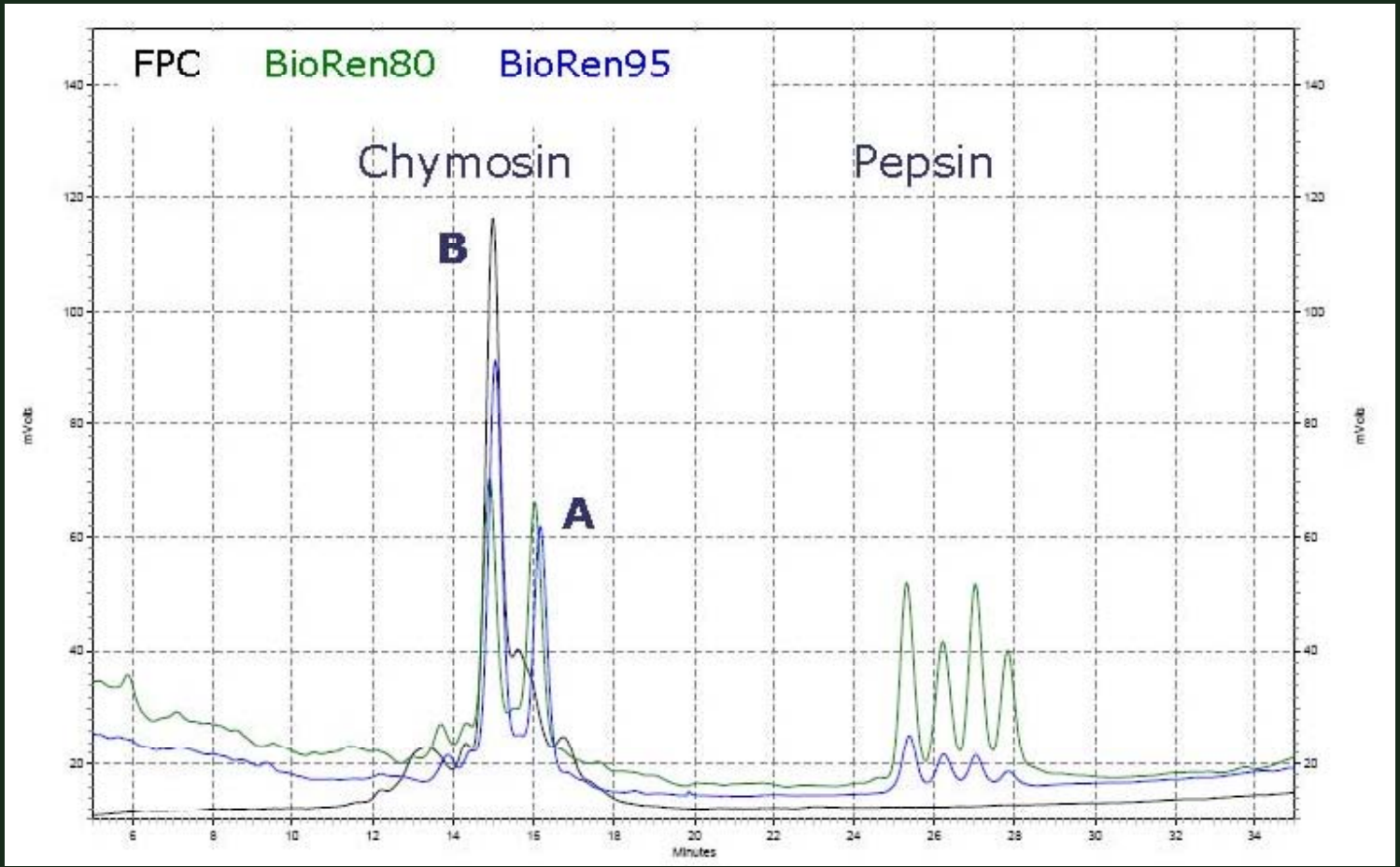
the secrets behind rennet substitutes

- **Recombinant (GMO) chymosin contains either only chymosin A or B, and not all subtypes and has some enzyme fractions that are not existing in natural rennet. So it is fitting perfectly to a perfect milk with one special type of casein – this milk is not existing in reality. The lack of natural pepsin also leads to different coagulation results during seasonal changes of the milk.**

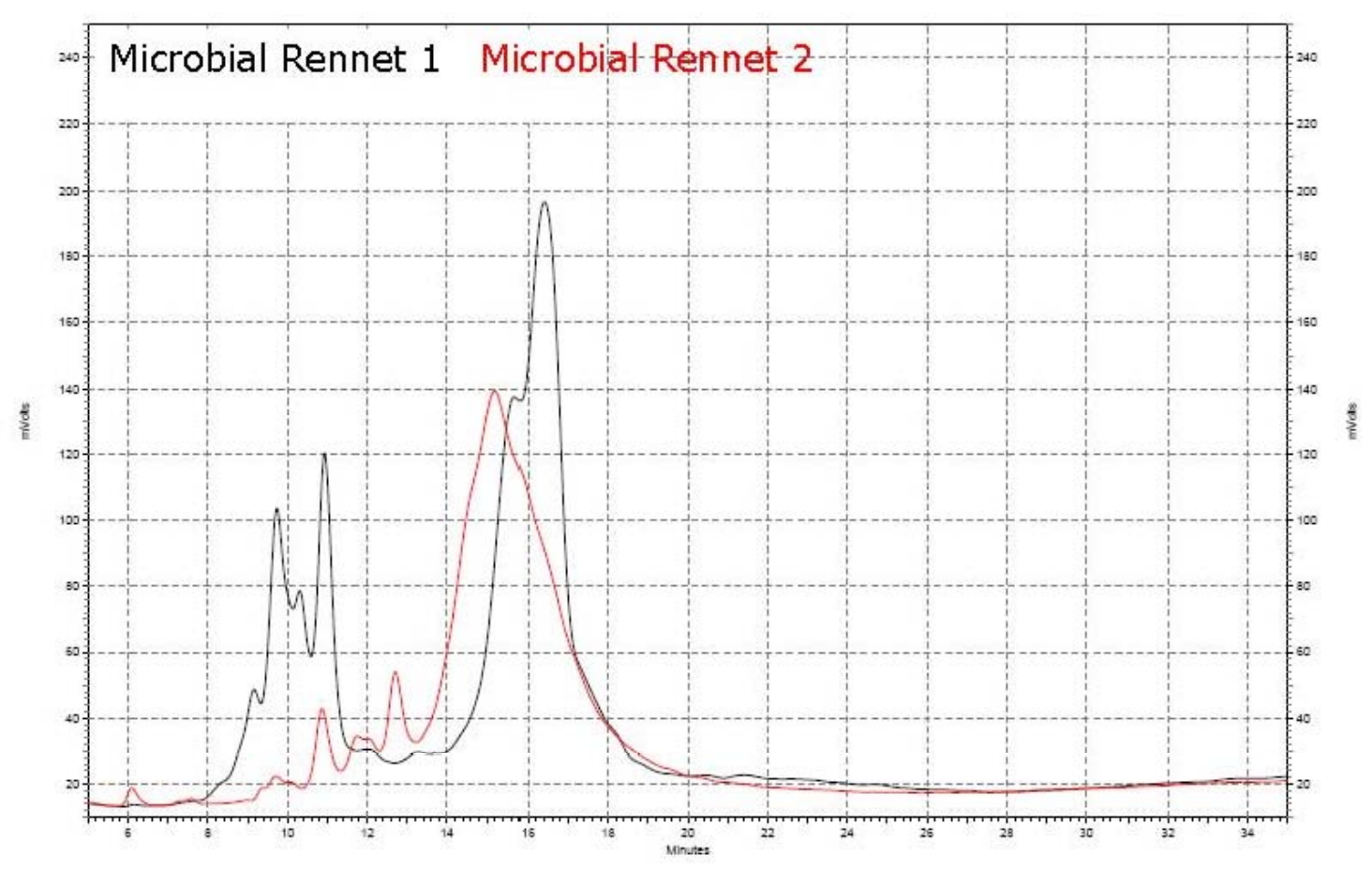
  Newest developments are even proposing to use genes from other mammals than calf, goat or lamb to arrive at a satisfying product which might be finally competitive against Natural Rennet.

  All this without proper information of the customers.

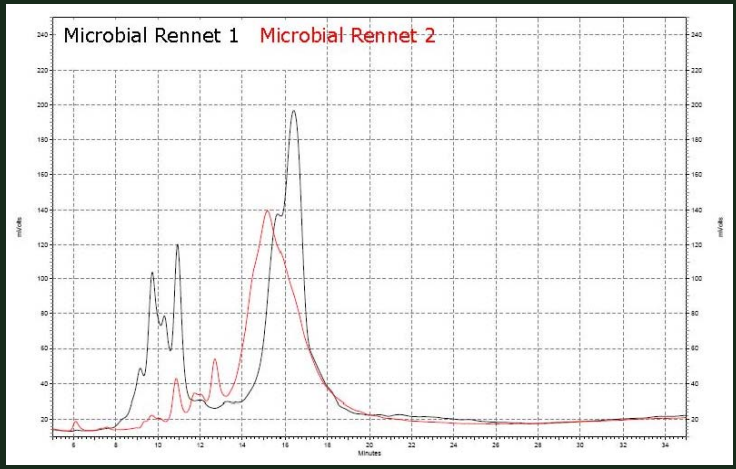
the secrets behind rennet substitutes



the secrets behind rennet substitutes



the secrets behind rennet substitutes



This graph shows the results of HPLC analysis of different Microbial Rennet Substitutes.

No one really knows, which of the different peaks is now really cleaving the casein and what is the effect of the other peaks.

Both analysed Microbial Rennet Substitutes had the same strength – 220 IMCU – but the total enzymatic surface differs very much.

Though both of the products claim to be produced by Mucormyces miehei, the presentation of the 2 Microbial Rennet Substitutes is totally different.

Natural Rennet

advantages

Mankind has tested Natural Rennet for now more than 6.000 years and found it as 100% safe as well for cheese-making as for consumption.

Only Natural Rennet guarantees a continuous coagulation also for cow's milk from different breeds and with different composition of casein.

The whole variety of cheeses has been developed by the use of Natural Rennet. Natural Rennet is always one of the main ingredients of all traditional cheeses.

Only Natural Rennet guarantees highest possible cheese yield and best possible flavour and taste.

disadvantages

Natural Rennet is a limited product. Because of a limited availability of calf stomachs, actually around 30% of the worlds cheese production can be done with Natural Rennet.

Natural Rennet is an animal based product and therefore disliked by Vegetarians.

Natural Rennet is an animal based product and therefore brought in connection with animal diseases like e.g. BSE.

Microbial Rennet substitutes

advantages

Microbial Rennet“ has an unlimited availability

„Microbial Rennet“ has very low production costs and has therefore also a cheap market price.

„Microbial Rennet“ is accepted by Vegetarians, Muslims, and Jewish.

„Microbial Rennet“ is by EC legislation also accepted for the production of organic cheeses.

disadvantages

„Microbial Rennet“ leads to bitterness in cheese.

„Microbial Rennet“ leads to financial losses in cheese-production due to losses in yield.

„Microbial Rennet“ as all products based on the fermentation of moulds are still in discussion because of Mycotoxines and other possible unknown extrolytes.

The EFSA (European Food Safety Authority) denies the QPS-status off all these products (Qualified Presumption of Safety) until further investigations

GMO Rennet substitutes

advantages	disadvantages
„GMO Rennet“ has an unlimited availability	„GMO Rennet“ only contains a fraction of the complete enzyme range of Natural Rennet. Despite the claimed “pureness” of this enzyme, the maturation results in e.g. Parmigiano were not satisfying.
„GMO Rennet“ has very low production costs and has therefore also a cheaper market price than Natural Rennet	„GMO Rennet“ is disliked by the European customers.
„GMO Rennet“ is accepted by Vegetarians, Muslims, and Jewish.	„GMO Rennet“ as all products based on the fermentation of moulds are still in discussion because of Mycotoxines and other possible unknown extrolytes.
„GMO Rennet“ delivers better results than “Microbial Rennet Substitutes”.	The EFSA denies the QPS-status off all these products until further investigations.

thank you very much for your attention