

The use of Sodium Fluoride

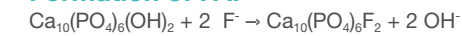
The use of fluoride in toothpaste retards and diminishes the dissolution of enamel. Enamel dissolves under influence of acid (pH <5,5), acid can come from mouth bacteria and from external (food).

Anionic fluoride in toothpaste reacts with the enamel (main component is hydroxyapatite HAP) which makes the enamel less acid soluble (fluorhydroxyapatite FAP).

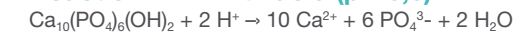
HAP equilibrium in water



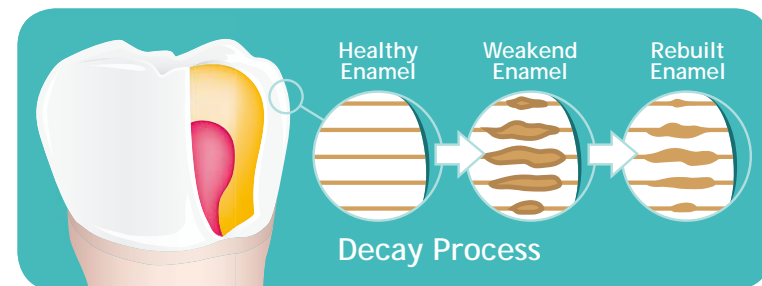
Formation of FAP



Reaction HAP with acid (pH 5,5)



Reaction FAP with acid (pH ≈ 4)

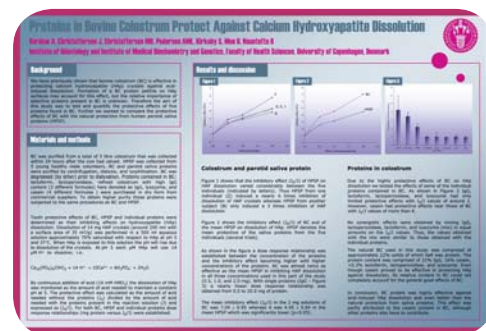


Tooth erosion - Tooth erosion is the dissolution of tooth enamel by an acid that is not coming from bacteria. As tooth enamel consists of 95% of a calcium hydroxyapatite (HAP) containing mineral, tooth enamel can dissolve in every acid. This acid mostly comes from acid drinks (f.e. soft drinks and juices), acid nutrition (as fruits) or from gastric acid by belching, vomiting (f.e. by anorexia nervosa, bulimia nervosa and alcoholism).

The neutralizing action of Saliva - Saliva offers a natural protection against tooth erosion. Saliva has a buffering action, so acids are neutralized. The buffer capacity of Saliva differs from person to person. The protecting proteins in Saliva form a protecting layer (pellicle) on the tooth surfaces. A large number of medicines or certain diseases can inhibit the Saliva production, and so a higher change on tooth erosion can be developed.

Abstract Proteins in bovine colostrum protect against calcium hydroxyapatite dissolution

We have previously shown that bovine colostrum (BC) is effective in protecting calcium hydroxyapatite (HAP) crystals against acid-induced dissolution. Formation of a BC protein pellicle on HAP surfaces may account for this effect, but the relative importance of selective proteins present in BC is unknown. Therefore the aim of this study was to test and quantify the protective effects of five proteins found in BC. Further we wanted to compare the protective effects of BC with the natural protection from human parotid Saliva proteins (HPSP).



Proteins in Bovine Colostrum Protect Against Calcium Hydroxyapatite Dissolution

This work was presented at the IADR meeting in Amsterdam 2005.

Proteins in Bovine Colostrum Protect Against Calcium Hydroxyapatite Dissolution - Bardow A., Christoffersen J., Christoffersen M.R., Pedersen A.M.L., Kirkeby S., Moe D., Nauntofte B.

Dentifrice With Colostrum and the Treatment of Plaque and Gingivitis - Rosema N.A.M., Hoenderdos N.L., Versteeg P.A., van der Velden U., van der Weijden G.A.

A Possible oral health effect of colostrum containing dentifrices - Barkvold P.

Oral findings in patients with primary Sjögren's syndrome and oral lichen planus - a preliminary study on the effects of bovine colostrums-containing oral hygiene products - Pedersen A.M. - Clin Oral Invest. 2002 Mar.

Effects of xylitol in an enzyme containing dentifrice without sodium lauryl sulphate on mutans streptococci in vivo - Jannesson L., Renvert S., Birkhed D. - Acta Odontol Scand. 1997 Aug.

The effect of two toothpaste detergents on the frequency of recurrent aphthous ulcers - Herlofson B.B., Barkvold P. - Acta Odontol Scand. 1996 Jun.

Fluoride in the Interdental Area after TWO Different Post-Brushing Water Rinsing procedures - Sjøgren K., Birkhed D., Rangmar B., Reinhold A.C. - Caries Res. 1996.

Irritation potential of seven dentifrices measured by the HET-CAM test - Kjørheim V., Rølla G.

Effect of a Modified Toothpaste Technique on Approximal Caries in Preschool Children - Sjøgren K., Birkhed D., Rangmar B. - Caries Res 1995.

Sodium lauryl sulphate and recurrent aphthous ulcers. A preliminary study - Herlofson B.B., Barkvold P. - Acta Odontol Scand. 1994 Oct.

Toxicity of Sodium Dodecyl Sulphate and Other Detergents in Cultures of human Oral Mucosa Epithelium - Arenholdt-Bindslev D., Bleeg H., Richards A.

Abstract

Dentifrice with colostrum and the treatment of plaque and gingivitis

Objectives: The objective of the present study was to assess whether a newly developed dentifrice with an enzyme complex is as effective as a regular SLS-dentifrice in the treatment of plaque and gingivitis.

Population: 120 subjects, ≥18 years, in good general health, at least 5 evaluable teeth per quadrant, no pockets > 5 mm, having moderate gingivitis at intake, defined as having at least 40% of the test sites showing bleeding on probing but not exceeding 70%.

Methods: This study, 2-group, parallel, double blind, was designed to evaluate the effect of a mild dentifrice on gingivitis in an 8-week clinical trial. 120 subjects (non-dental) were selected on having moderate gingival inflammation. At baseline, plaque (Quigley & Hein) and bleeding upon marginal probing (BOMP) were assessed. Subjects were randomly divided among 2 groups; Test group 1 used zendium® Freshmint dentifrice; Control group 2 used a regular SLS-dentifrice. Both groups brushed

with a regular manual Soft toothbrush. After 4-weeks and after 8-weeks the clinical indices were re-assessed. At the first and second assessment participants received a new manual toothbrush.

Results: For both groups 58 subjects completed the protocol. BI decreased from 0.80 at session 1 to 0.60 at session 3 for the test group and from 0.80 to 0.56 for the control group. PI decreased from 2.06 at session1 to 1.88 at session 3 for the test group and from 1.99 to 1.82 for the control group. No statistically significant differences could be detected.

Conclusion: The test dentifrice using a mild bio-active enzymes complex, without SLS, containing enzymes, colostrum, lysozyme, lactoferrin & zinc was as effective as a regular SLS dentifrice on plaque and gingival health.

Keywords: dentifrice, plaque, gingivitis, colostrum, clinical trial.

This study was sponsored by Sara Lee.

	Week 0	Week 4	Week 8
Plaque			
Test	N=58 2.06 (0.47)	1.96 (0.38)	1.88 (0.36)
Control	N=58 1.99 (0.46)	1.90 (0.41)	1.82 (0.41)
P-value		0.329	0.325
Bleeding			
Test	N=58 0.80 (0.19)	0.64 (0.18)	0.60 (0.23)
Control	N=58 0.80 (0.19)	0.64 (0.18)	0.56 (0.24)
P-value		0.895	0.328
Gingival Abrasion			
Test	N=58 4.72 (0.11)	3.88 (0.10)	3.40 (0.20)
Control	N=58 5.60 (0.32)	4.50 (0.86)	5.29 (0.09)
P-value		0.490	0.908

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Abstract Title
Dentifrice With Colostrum and the Treatment of Plaque and Gingivitis

This work was presented at the 42nd annual meeting of Continental European and Israeli Divisions, IADR meeting in Thessaloniki, Greece 2007.

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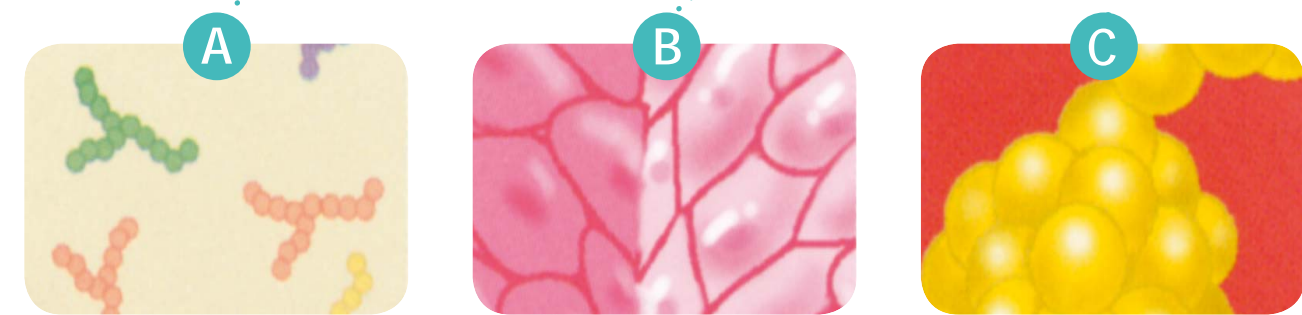
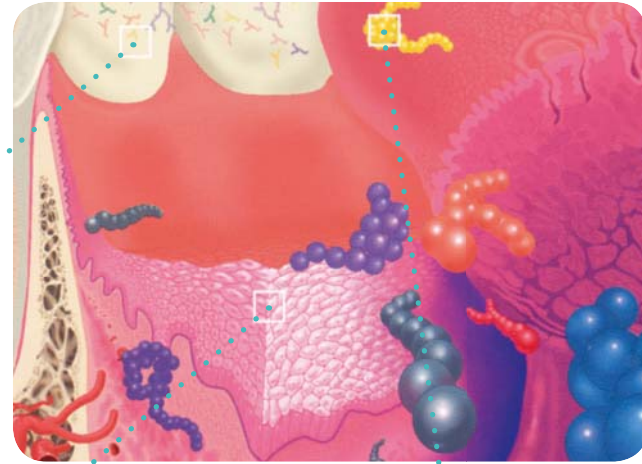
zendium



professional dental care

The barrier function of mucous membranes, mucin layer and proteins

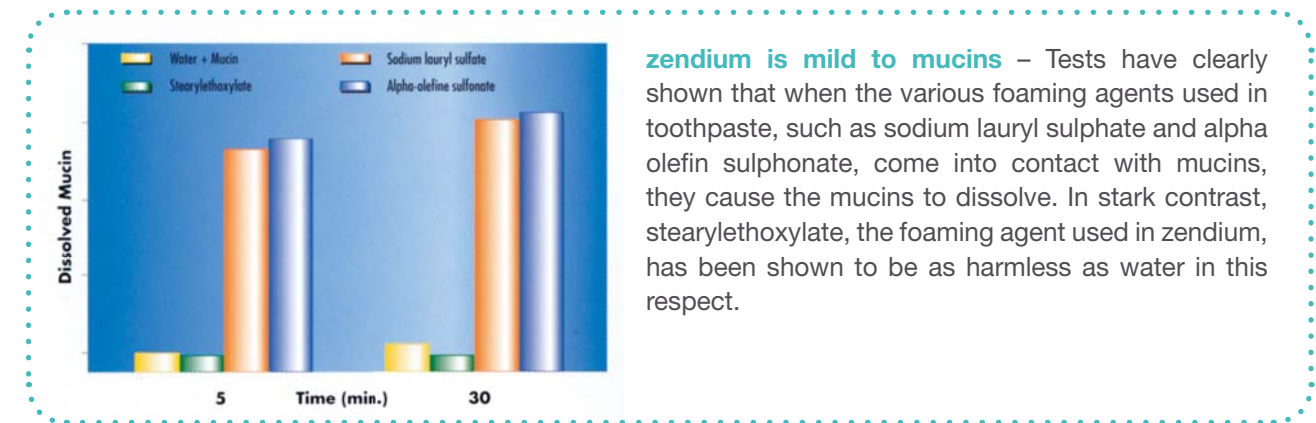
The mouth is not only the point of entry for the nutrients required by the body. It can also be the means by which less desirable substances gain access to the body. Hence the mouth is equipped with a finely tuned defense mechanism which can be divided into three levels:



- A Coating** – Mucins are glycoproteins produced by Salivary glands. They have various functions, depending upon the length of their chains and their spatial structure. Certain mucins form a protective coating and keep the mucous membranes moist. This coating also covers the hard tissues of the teeth, where it takes the form of a pellicle, offering protection against wear and erosion.
- B Barrier** – The mucous epithelium, just as other epithelia in the body, forms a natural barrier against penetration by harmful substances.
- C Antibacterial proteins** – Saliva contains a whole range of systems, each of which combats the growth or attachment of harmful micro-organisms in its own way. The most common of these are immunoglobulins, lysozyme, lactoferrin, lactoperoxidase, mucins, histatins and cystatins. These are all proteins with a more or less specific function, aimed at preventing infections in the mouth.

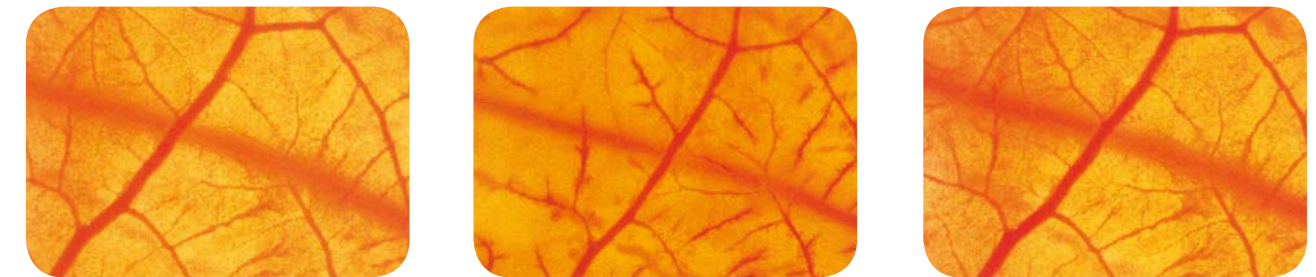
Laboratory tests for mildness

Laboratory tests for mildness – When a cleaning agent like toothpaste detergent comes into contact with a mucosa epithelium culture, it has a damaging effect. Research using various detergents in a concentration of 1% shows that the cells are completely destroyed after 5 minutes of direct contact. The zendum detergent, stearylthoxylylate, is a welcome exception to this rule. Tests have demonstrated that this detergent produces no negative effect on cells.



zendum is mild to mucins – Tests have clearly shown that when the various foaming agents used in toothpaste, such as sodium lauryl sulphate and alpha olefin sulphonate, come into contact with mucins, they cause the mucins to dissolve. In stark contrast, stearylthoxylylate, the foaming agent used in zendum, has been shown to be as harmless as water in this respect.

“HET-CAM” irritation test – The HET-CAM (Hen’s Egg Chorioallantoic Membrane) test is an alternative to experiments on animals. It measures the level of irritation caused by cosmetic products. Of the seven toothpastes studied, zendum was the only one to emerge from this test with the classification “completely non-irritant”.



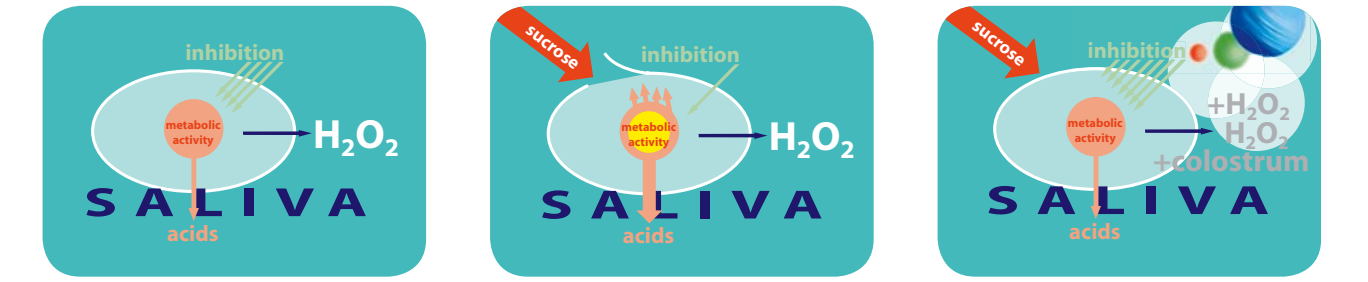
Oral mucosa before toothbrushing. Oral mucosa after toothbrushing with toothpaste containing SLS. Oral mucosa after toothbrushing with toothpaste without SLS.

Enzymes in zendum

Proteins in zendum – zendum has focused on another safe biological system that could contribute to the Salivary defense to make zendum stronger and more complete. This new ingredient is colostrum. Colostrum is the very first milk produced by mammals after giving birth and it contains antibacterial and protective substances. Colostrum contains amongst others immunoglobulins and also some anti-microbial substances like lactoferrin, lactoperoxidase and lysozyme. The actives from colostrum are also natural constituents of Saliva. In Saliva these natural actives are also involved in the protection of the oral cavity by exhibiting anti

microbial activity. Therefore, colostrum fits perfectly well the zendum philosophy i.e. to use nature’s defense system from Saliva for protection of the oral cavity against almost all ailments. zendum helps nature – the Saliva to ensure a healthy mouth.

Enzymes in zendum – The enzymes amyloglucosidase and glucose oxidase lead to inhibition of bacterial growth by boosting the natural defense of Saliva’s lactoperoxidase system. According to the following reaction thiocyanate ion and hydrogen peroxide lead to the formation of hypothiocyanite ion which has bacteria-inhibiting properties.



Sensitive teeth

Sensitivity – More and more people are able to keep their own dentition for their whole lives. When people grow older, gums very often start to recede. Where gums are retracted, tooth necks become exposed to the oral environment. Roots consist of dentine. Dentine, which is not covered by cement, enamel or gingival is at risk to several problems. Exposed dentine is sometimes sensitive to acid and to high or low temperatures. A pain sensation can also be felt when dentine is touched, by tooth cleaning instruments for instance. Sensitivity occurs when the openings of the dentine tubuli are no longer covered by root cementum or by the so-called smear layer. It has been shown that people with hypersensitivity complaints have eight times more open tubuli, than people without these problems. Teeth with dentine sensitivity also show wider tubuli openings. Sensitivity often occurs at those sites, which are under too great pressure during brushing, and which as a result exhibit dentine abrasion. Frequently the bucco-cervical parts of cuspids and premolars are affected. Right-handed people have problems predominantly in the left part of the mouth, left handed people in the right side, probably caused the brushing power. Further, the presence of plaque can lead to sensitivity.

Treatment – zendum Sensitive contains potassium nitrate which has a desensitising effect. At first it was assumed that desensitising of the dentine following application of potassium nitrate was a result of closure of the dentine tubuli by a process of crystal formation. However, other examinations suggest that potassium desensitisation is merely a result of raising the potassium concentration within the dentine tubuli rendering the nerves less sensitive to further stimuli.

Furthermore it has a low abrasive formulation with a maximum concentration of sodium fluoride 1450 ppm F.

