Ref2

[J Clin Periodontol.](http://www.ncbi.nlm.nih.gov/pubmed/6964679) 1982 Jul;9(4):346-54.

**Effects of sugared and sugar-free chewing gum on the accumulation of plaque and debris on the teeth.**

[Addy M](http://www.ncbi.nlm.nih.gov/pubmed?term=Addy%20M%5BAuthor%5D&cauthor=true&cauthor_uid=6964679), [Perriam E](http://www.ncbi.nlm.nih.gov/pubmed?term=Perriam%20E%5BAuthor%5D&cauthor=true&cauthor_uid=6964679), [Sterry A](http://www.ncbi.nlm.nih.gov/pubmed?term=Sterry%20A%5BAuthor%5D&cauthor=true&cauthor_uid=6964679).

**Abstract**

The aim of this study was to determine the effects of sugar-free and sugar-containing gums on plaque formation, established plaque and salivary debris. Plaque accumulating during three 5-day periods was recorded in a group of 10 students who, in the absence of normal oral hygiene methods, chewed sugar-free or sugar-containing chewing gum or did not chew gum. In a second group of 10 students the effect of chewing the two types of gum on 3-day accumulations of plaque was recorded. Finally, the wet weight of liquorice debris present in saliva with and without gum chewing, was recorded. During the no chewing periods distinct and significant differences in the amounts of plaque accumulating at different sites were apparent. Both types of chewing gum significantly and comparably reduced plaque accumulation during the 5-day period. The chewing gums also significantly reduced established plaque on many tooth surfaces. Salivary debris was significantly reduced by 50% after chewing gum. It was noted that plaque removal occurred primarily from sites remote from the gingival margin and interdental areas and therefore it was concluded that the observed effects of chewing gum on plaque would not be reflected in a reduction in gingival inflammation.

Ref3

[Caries Res.](http://www.ncbi.nlm.nih.gov/pubmed/1628291) 1992;26(3):176-82.

**Effects of nine different chewing-gums and lozenges on salivary flow rate and pH.**

[Dawes C](http://www.ncbi.nlm.nih.gov/pubmed?term=Dawes%20C%5BAuthor%5D&cauthor=true&cauthor_uid=1628291), [Macpherson LM](http://www.ncbi.nlm.nih.gov/pubmed?term=Macpherson%20LM%5BAuthor%5D&cauthor=true&cauthor_uid=1628291).

**Source**

Department of Oral Biology, Faculty of Dentistry, University of Manitoba, Winnipeg, Canada.

**Abstract**

The objectives of this study were to determine how salivary flow rate and pH vary with time during use of chewing-gums and lozenges. Twenty-four young adults collected unstimulated saliva and then, on different occasions, chewed one of six flavoured gums, or gum base, or sucked on one of two lozenges, for 20 min, during which time eight separate saliva samples were collected. Flow rate peaked during the 1st minute of stimulation with all nine products. With the lozenges, flow rate fell towards the unstimulated rate when the lozenges had dissolved. There were no significant differences in the flow rates elicited by cinnamon- or peppermint-flavoured gums or between sugar-containing or sugar-free gums. With the flavoured gums, the mean flow rate followed a power curve (r = -0.992) with time and within about 10 min was not significantly different from that when gum base was the stimulus. The initial stimulated flow rate with flavoured gums was about 10-12 times greater than the unstimulated rate (0.47 ml/min). After 20 min of chewing, it was still about 2.7 times that rate and about the same as the flow rate elicited by chewing-gum base alone. The pH of unstimulated saliva was about 6.95. With one gum containing about 1.5% organic acids, the salivary pH fell to a minimum of 6.18 in the 1st minute of stimulation, but then rose rapidly to a level above that in unstimulated saliva. With a sucrose-containing and a sucrose-free gum, the pH rose immediately on stimulation and then fell slightly with time to levels which were significantly above the pH of unstimulated saliva.

Ref4

**In situ Remineralization of Subsurface Enamel Lesion after the Use of a Fluoride Chewing Gum**
Lamb W.J. · Corpron R.E. · More F.G. · Beltran E.D. · Strachan D.S. · Kowalski C.J.
Caries Res 1993;27:111–116 (DOI: 10.1159/000261527)

## Abstract

In situ remineralization of early enamel lesions by a fluoride chewing gum was studied. Human enamel specimens with subsurface lesions were mounted in removable lower appliances for 6 adults. Subjects used a F-free dentifrice 3 ×/day and chewed five sticks/day for the F gum group (0.1 mg F/stick) or five sticks of sugarless gum. No gum was chewed for controls. Surface microhardness was performed on: (1) sound enamel; (2) lesions; (3) after intraoral exposure, and (4) after acid-resistance testing (ART). Separate specimens were etched and measured for F uptake and image analyses on microradiographs were performed for all regimens. ΔZ values were calculated and converted to percent of mineralization. Values for F gum were significantly higher (p > 0.05) than non-F gum and controls for ART, percent remineralization, and F uptake up to 70 μm depth.

**Ref 5**

[Magnes Res.](http://www.ncbi.nlm.nih.gov/pubmed/17402295) 2006 Dec;19(4):268-75.

**Magnesium intake is inversely associated with the prevalence of tooth loss in Japanese pregnant women: the Osaka Maternal and Child Health Study.**

[Tanaka K](http://www.ncbi.nlm.nih.gov/pubmed?term=Tanaka%20K%5BAuthor%5D&cauthor=true&cauthor_uid=17402295), [Miyake Y](http://www.ncbi.nlm.nih.gov/pubmed?term=Miyake%20Y%5BAuthor%5D&cauthor=true&cauthor_uid=17402295), [Sasaki S](http://www.ncbi.nlm.nih.gov/pubmed?term=Sasaki%20S%5BAuthor%5D&cauthor=true&cauthor_uid=17402295), [Ohya Y](http://www.ncbi.nlm.nih.gov/pubmed?term=Ohya%20Y%5BAuthor%5D&cauthor=true&cauthor_uid=17402295), [Miyamoto S](http://www.ncbi.nlm.nih.gov/pubmed?term=Miyamoto%20S%5BAuthor%5D&cauthor=true&cauthor_uid=17402295), [Matsunaga I](http://www.ncbi.nlm.nih.gov/pubmed?term=Matsunaga%20I%5BAuthor%5D&cauthor=true&cauthor_uid=17402295), [Yoshida T](http://www.ncbi.nlm.nih.gov/pubmed?term=Yoshida%20T%5BAuthor%5D&cauthor=true&cauthor_uid=17402295), [Hirota Y](http://www.ncbi.nlm.nih.gov/pubmed?term=Hirota%20Y%5BAuthor%5D&cauthor=true&cauthor_uid=17402295), [Oda H](http://www.ncbi.nlm.nih.gov/pubmed?term=Oda%20H%5BAuthor%5D&cauthor=true&cauthor_uid=17402295); [Osaka Maternal and Child Health Study Group](http://www.ncbi.nlm.nih.gov/pubmed?term=Osaka%20Maternal%20and%20Child%20Health%20Study%20Group%5BCorporate%20Author%5D).

**Source**

Department of Public Health, Faculty of Medicine, Fukuoka University, Fukuoka, Japan. k-tanaka@fukuoka-u.ac.jp

**Abstract**

There have only been a few studies on the role of mineral intake in tooth loss. We investigated the association between mineral intake and the prevalence of tooth loss in Japan. We used the baseline data on 1002 pregnant women who were enrolled in the Osaka Maternal and Child Health Study between November 2001 and March 2003. Tooth loss was defined as the previous extraction of one or more teeth. Nutrient intake was assessed by a validated diet history questionnaire. Prevalence odds ratios and confidence intervals were estimated by applying a multiple logistic regression model. The adjusted odds ratio upon comparison of the highest quartile with the lowest quartile of magnesium intake was 0.64 (95% confidence interval, 0.42-0.99), showing a tendency for an inverse dose-response relationship (p for linear trend = 0.05). There were no associations between the level of consumption of calcium, phosphate, iron, zinc, or copper and tooth loss. The present findings suggest that intake of magnesium is related to reduced prevalence of tooth loss among young Japanese women.

Ref 6

[J Dent Res.](http://www.ncbi.nlm.nih.gov/pubmed/16183794) 2005 Oct;84(10):937-41.

**Magnesium deficiency is associated with periodontal disease.**

[Meisel P](http://www.ncbi.nlm.nih.gov/pubmed?term=Meisel%20P%5BAuthor%5D&cauthor=true&cauthor_uid=16183794), [Schwahn C](http://www.ncbi.nlm.nih.gov/pubmed?term=Schwahn%20C%5BAuthor%5D&cauthor=true&cauthor_uid=16183794), [Luedemann J](http://www.ncbi.nlm.nih.gov/pubmed?term=Luedemann%20J%5BAuthor%5D&cauthor=true&cauthor_uid=16183794), [John U](http://www.ncbi.nlm.nih.gov/pubmed?term=John%20U%5BAuthor%5D&cauthor=true&cauthor_uid=16183794), [Kroemer HK](http://www.ncbi.nlm.nih.gov/pubmed?term=Kroemer%20HK%5BAuthor%5D&cauthor=true&cauthor_uid=16183794), [Kocher T](http://www.ncbi.nlm.nih.gov/pubmed?term=Kocher%20T%5BAuthor%5D&cauthor=true&cauthor_uid=16183794).

**Source**

Department of Pharmacology, Ernst Moritz Arndt University, F.-Loeffler-Str. 23d, D-17487 Greifswald, Germany. meiselp@unigreifswald.de

**Abstract**

In the multifactorial pathogenesis of periodontitis, there are still unknown factors influencing the outcome of the disease. An association between magnesium and periodontitis has been suggested by preliminary studies. However, relevant clinical data are lacking. We investigated the association between magnesium status and periodontal health in a population-based analysis. We conducted a cross-sectional epidemiological investigation involving 4290 subjects aged 20-80 yrs. We recorded periodontal risk factors and determined concentrations of serum magnesium and calcium, relating them to periodontal parameters. In a matched-pair study, 60 subjects using oral magnesium-containing drugs and 120 without were compared. In subjects aged 40 yrs and older, increased serum Mg/Ca was significantly associated with reduced probing depth (p<0.001), less attachment loss (p=0.006), and a higher number of remaining teeth (p=0.005). Subjects taking Mg drugs showed less attachment loss (p<0.01) and more remaining teeth than did their matched counterparts. These results suggest that nutritional magnesium supplementation may improve periodontal health.

Ref 7

[Am J Med.](http://www.ncbi.nlm.nih.gov/pubmed/11690570) 2001 Oct 15;111(6):452-6.

# Calcium and vitamin D supplements reduce tooth loss in the elderly.

[Krall EA](http://www.ncbi.nlm.nih.gov/pubmed?term=Krall%20EA%5BAuthor%5D&cauthor=true&cauthor_uid=11690570), [Wehler C](http://www.ncbi.nlm.nih.gov/pubmed?term=Wehler%20C%5BAuthor%5D&cauthor=true&cauthor_uid=11690570), [Garcia RI](http://www.ncbi.nlm.nih.gov/pubmed?term=Garcia%20RI%5BAuthor%5D&cauthor=true&cauthor_uid=11690570), [Harris SS](http://www.ncbi.nlm.nih.gov/pubmed?term=Harris%20SS%5BAuthor%5D&cauthor=true&cauthor_uid=11690570), [Dawson-Hughes B](http://www.ncbi.nlm.nih.gov/pubmed?term=Dawson-Hughes%20B%5BAuthor%5D&cauthor=true&cauthor_uid=11690570).

### Source

Department of Health Policy and Health Services Research, Boston University Goldman School of Dental Medicine, 715 Albany Street, Boston, MA O2118, USA.

### Abstract

#### PURPOSE:

Oral bone and tooth loss are correlated with bone loss at nonoral sites. Calcium and vitamin D supplementation slow the rate of bone loss from various skeletal sites, but it is not known if intake of these nutrients affects oral bone and, in turn, tooth retention.

#### SUBJECTS AND METHODS:

Tooth loss was examined in 145 healthy subjects aged 65 years and older who completed a 3-year, randomized, placebo-controlled trial of the effect of calcium and vitamin D supplementation on bone loss from the hip, as well as a 2-year follow-up study after discontinuation of study supplements. Teeth were counted at 18 months and 5 years. A comprehensive oral examination at 5 years included assessment of caries, oral hygiene, and periodontal disease. The odds ratio (OR) and 95% confidence interval (CI) of tooth loss were estimated by stepwise multivariate logistic regression. Initial age (mean +/- SD) of subjects was 71 +/- 5 years, and the number of teeth remaining was 22 +/- 7.

#### RESULTS:

During the randomized trial, 11 of the 82 subjects (13%) taking supplements and 17 of the 63 subjects (27%) taking placebo lost one or more teeth (OR = 0.4; 95% CI: 0.2 to 0.9). During the 2-year follow-up period, 31 of the 77 subjects (40%) with total calcium intake of at least 1000 mg per day lost one or more teeth compared with 40 of the 68 subjects (59%) who consumed less (OR = 0.5; 95% CI: 0.2 to 0.9).

#### CONCLUSION:

These findings suggest that intake levels of calcium and vitamin D aimed at preventing osteoporosis have a beneficial effect on tooth retention.

Ref 8

[Pharmacol Res.](http://www.ncbi.nlm.nih.gov/pubmed/15501704) 2004 Dec;50(6):637-41.

# Effect of supplementation of calcium and vitamin D on bone mineral density and bone mineral content in peri- and post-menopause women; a double-blind, randomized, controlled trial.

[Di Daniele N](http://www.ncbi.nlm.nih.gov/pubmed?term=Di%20Daniele%20N%5BAuthor%5D&cauthor=true&cauthor_uid=15501704), [Carbonelli MG](http://www.ncbi.nlm.nih.gov/pubmed?term=Carbonelli%20MG%5BAuthor%5D&cauthor=true&cauthor_uid=15501704), [Candeloro N](http://www.ncbi.nlm.nih.gov/pubmed?term=Candeloro%20N%5BAuthor%5D&cauthor=true&cauthor_uid=15501704), [Iacopino L](http://www.ncbi.nlm.nih.gov/pubmed?term=Iacopino%20L%5BAuthor%5D&cauthor=true&cauthor_uid=15501704), [De Lorenzo A](http://www.ncbi.nlm.nih.gov/pubmed?term=De%20Lorenzo%20A%5BAuthor%5D&cauthor=true&cauthor_uid=15501704), [Andreoli A](http://www.ncbi.nlm.nih.gov/pubmed?term=Andreoli%20A%5BAuthor%5D&cauthor=true&cauthor_uid=15501704).

### Source

Human Nutrition Unit, Via Montpellier 1, University of Rome, "Tor Vergata", 00173 Rome, Italy.

### Abstract

#### BACKGROUND:

Osteoporosis is a serious global health problem for the future, that is why improving diagnostic methods and prevention of this disease could be helpful.

#### OBJECTIVES:

To assess the effects of calcium supplementations combined with Vitamin D on bone mineral density (BMD) and bone mineral content (BMC) in a representative sample of peri- and post-menopausal women in a double-blind, a randomized, controlled trial was untaken.

#### DESIGN:

A total of 120 women aged over 45 were included in a randomised placebo-controlled, double-blind trial on the effect of a daily dietary supplementation of calcium and Vitamin D on bone mineral density and bone mineral content; over a 30-month period.

#### METHODS:

Dietary intake assessment; dual-energy X-ray absorptiometry to measure total body and segmental bone mineral density and bone mineral content at beginning of the study and every 15 months were undertaken.

#### RESULTS:

There was no significant change in dietary calcium or Vitamin D intakes in either of the treatment groups during the 30-month intervention period. The change in total BMD in the calcium group was significantly different from that in the placebo group (P <0.005). The placebo group lost a total BMD at a rate of about 0.4% per year. There was an inverse correlation between BMD and age.

#### CONCLUSIONS:

The effect of calcium and Vitamin D supplementation on bone mineral density of calcium has been demonstrated in this group of young adult women. Our results showed the positive effect of calcium and Vitamin D supplementation in women both peri- and post-menopausal status; for this reason a supplementation of calcium and Vitamin D should be recommended as a strategic option in helping to prevent early postmenopausal bone loss.