

Table 1 – Brief summary of trials which included xylitol chewing gum and reported effectiveness of xylitol use^s

Study	Population	Dosing Rationale	Xylitol Frequency	Xylitol Dose (grams/day)	Outcome Measures	Conclusions
24 months RCT 3 groups: Xylitol, Fructose, Sucrose	adult N=125 mean Age 27 years dental students	NSS*	mean 4.5 pieces/d (range 3-7)	6-7	DMFS	no new DMFS in xylitol group compared to 7 new DMFS in sucrose group [14]
12 months RCT 2 groups: Xylitol & Sucrose	adult N=102 mean Age 22 years dental students	NSS	mean 4.5 pieces/d (mange 3-7)	6-7	DMFS	DMFS decreased by 1 in xylitol group, 3 new DMFS in sucrose group [15]
4 weeks cross-over RCT 3 groups: Xylitol, Fructose, Sorbitol/Mannitol	children N=80 pedodontic clinic	NSS	2 pieces, 5x/d non-supervised chewing	5-7	saliva and plaque <i>S. mutans</i> level	reduction in unstimulated saliva and plaque <i>S. mutans</i> level [16]
3 years RCT 3 groups: xylitol + xylitol/fluoride dentifrice, fluoride dentifrice only, no fluoride + restorative only	children N= institutionalized children	NSS	gum and snack foods	14-20	DMFS	DMFS increment in the xylitol group = 4.2 fluoride group = 6.5, and control group = 7.7 [17]
24 months RCT 3 groups: Xylitol 15%, Xylitol 65%, no gum control	children N=433 age 8-9 years 13 schools	NSS	1 piece, 3x/d, school days, supervised chewing	xylitol 15% = 0.8 xylitol 65% = 3.4	DMFS increment	DMFS increment xylitol groups = 2.24 no gum control = 6.06 [18]
Retrospective frequency study Stratified into 3 groups	children N=212 age 11-12 years		1 piece, 3x/d, non-supervised chewing	10.5	change in DMFS	DMFS index decreased with frequency of > 3x/d group. 2.5x/d group no difference [6]
32 months RCT 2 groups, xylitol and no xylitol snack foods (including gum)	children N=468 age 6-12	NSS	daily mix of different xylitol snack foods	Maximum 20 (combination of snack foods)	DMFS increment	lower DMFS increment vs. controls. [19]
24 months RCT 2 groups: Xylitol vs. no gum	children N=212 age 11-12 years	NSS	1 piece, 3x/d, non-supervised chewing	10.5	DMFS increment	lower DMFS increment vs. control[20]
Retrospective frequency study	young adult N=100 mean Age 22 years		mean 4.5 pieces/d (range 3-7)	6-7	DMFS	reduction in DMFS with increased daily consumption frequency [7]

Table 1 (continue)

Study	Population	Dosing Rationale	Xylitol Frequency	Xylitol Dose (grams/day)	Outcome Measures	Conclusions
3 months Field study xylitol gum and tablets freely available without restriction	confectionary workers N=239 age 43 year $\pm$ 10	NSS	average 7 pieces/d xylitol gum and tablets	Average 3.9 (0.45 g/gum piece)	<i>S. mutans</i> in stimulated saliva	reduction in number of participants with <i>S. mutans</i> count $>10^6$ CFU/ml [21]
25 days cross-over trial 4 groups 3 Xylitol groups, 1 Sorbitol control	adult N=20 mean Age 26 years (19-37)	NSS	12x/d	Xylitol 70% = 13.4 Xylitol 35% = 6.7 Xylitol 17.5% = 3.36	stimulated and unstimulated saliva and plaque mutans streptococci	higher xylitol level– lower MS counts in plaque and saliva. Xylitol 17.5% no difference vs. control [22]
24 months RCT 6 groups: 3 Xylitol, 2 Sorbitol, 1 no gum control	children N=510 age 6 years 10 Schools	NSS	1 stick or 2 pellets, 5x/d. School or parent supervised	3:2 xyl/sorb** = 7.1 4:1 xyl/sorb = 9.7 Xylitol-Stick = 10.4 Xylitol-Pellet = 10.7	caries rate	caries rate reduced in groups chewing gums. 100% Xylitol-Pellet most effective [23]
40 months RCT 9 groups: 6 Xylitol, 1 Sorbitol, 1 Sucrose, 1 no gum control	children N=1,227 age 10 years	NSS	Sticks or pellets 3-5x/d, school days and non-school days chewing	3:2 xyl/sorb = 5.9 1:3 xyl/sorb = 2.0 Stick-3x/d = 5.4 Stick-5x/d = 9.0 Pellet-3x/d = 4.3 Pellet-5x/d = 8.5	caries increment	Sucrose group higher caries than no gum. Fewer caries in xylitol and/or sorbitol gum groups compared to no gum: 100% Xylitol-Pellet most effective [24]
16 months Intensive treatment: 1 group: high risk participants	children N=109 mean age 13.5 years	Intensive xylitol	7x/d, mostly non-supervised	14	caries onset rate, and DMFS	reduction in caries onset rate, reduction in DMFS scores[12]
3 months RCT 3 groups: Xylitol, Sorbitol, No gum control	adults N=164 age 36 years $\pm$ 15	NSS	2 pellets, 3x/d non-supervised chewing	not specified (commercially available gum)	stimulated saliva <i>S. mutans</i> count	salivary <i>S. mutans</i> level in xylitol group lower than sorbitol or control [25]
3 months RCT 3 groups: Xylitol 55%, Xylitol 100%, No gum controls.	children N=91 age 10-12 years 1 school	NSS	2 pieces, 3x/d School days, supervised chewing	55% = 5.8 100% = 11.9	stimulated saliva and plaque mutans streptococci	reduction in saliva and plaque mutans streptococci counts [9]

* NSS = Not specifically stated in the report of the study. Most often, the introduction of the reports may have referenced previous studies with their dosing and frequency. However, the reports did not specifically justify their rationale for choosing their dose or frequency of xylitol use.

** xyl/sorb = xylitol/sorbitol. 3:2 xyl/sorb implies a xylitol/sorbitol ratio of 3:2 in the gum formulation.

§ Machiulskiene et al. [5] reported no significant differences in effect among chewing gum groups in a 5-arms study: [xylitol (0.589g/piece); sorbitol (0.589g/piece); sorbitol/carbamide (0.569g/0.020g/piece); control gum (no polyols); and no-gum group]. Children in gum groups were asked to chew 5 pieces/day, chew for 10 mins/piece preferably after meals. For the xylitol group, 5 pieces = 2.95g xylitol/day. The author concluded that caries preventive effect of chewing sugar-free gum is related to the chewing process. In an Article Analysis & Evaluation, Hayes [26] argued that Machiulskiene et al.'s conclusion was invalid because the study was not an equivalency study designed. Furthermore, xylitol gum was the only group that showed a significant difference compared to no gum even at the low dose of about 3g xylitol/d.