

Anticaries Efficacy of Healthy Gum/Healthy Mouth Dentifrices

W.F. Landrigan*, J.M. Best, S.L. Eversole, R.V. Faller

Procter & Gamble Co., Mason, OH, USA

1598

ABSTRACT

There are currently a number of toothpastes available in the market which claim to aid in maintaining healthy mouths and gums. All of these products are also expected to deliver anticaries benefits, in addition to the reported gum health activity. The purpose of this study was to measure the relative anticaries efficacy of products that are currently in the market which are formulated to provide these gum related effects. As animal caries studies are routinely utilized to demonstrate relative anticaries efficacy of fluoride-based toothpastes, a well defined animal (rat) caries model (Francis, et al. *Arch Oral Biol* 1966;11:141) was used for this assessment. Test products included: (A) Crest® Gum Care, which contains stannous fluoride (SnF₂) for maintaining healthy gums as well as being the anticaries agent; (B) Listerine® Toothpaste, which utilizes a blend of essential oils as specialized ingredients and Sodium Monofluorophosphate (SMFP) as the anticaries active; (C) Colgate Tartar Control with Baking Soda and Peroxide®, a peroxide based formula (for healthy mouth) and SMFP as the anticaries ingredient. In addition, fluoride dose response controls containing (D) 250ppm F (NaF) and (E) placebo (0ppm F) toothpastes were included as internal study controls. Results of this study, reported as average number of hypomineralized areas (x HMA) and the respective % reduction in caries (relative to placebo) are as follows: A:54.3 (57); B:82.4 (35); C:74.7 (41); D:104.9 (17); and E:126.3 (0), with A>C=B>D>E at p=0.05, ANOVA. **These results demonstrate significant differences in the anticaries effectiveness of marketed fluoride dentifrices which are also intended to maintain healthy mouths and gums. Among the healthy mouth/healthy gum dentifrices tested, Crest® Gum Care provides the highest level of anticaries efficacy.**

INTRODUCTION

Many marketed toothpastes are sold with the specific intent of providing a delivery system for fluoride which has been proven effective for maintaining healthy teeth.

Some of the newer introductions into the toothpaste market contain additional ingredients which are intended to provide benefits over and above anticaries efficacy. These ingredients include stannous fluoride, essential oils, baking soda, peroxide, etc. Although the level of benefits associated with some of these ingredients is questionable, it is commonly accepted by the dental profession that any compound added to a toothpaste that is not detrimental - yet encourages a patient to brush, is considered a positive. Still, it is important for patients to know and understand that not all toothpastes are alike. Brushing longer with a less efficacious toothpaste can certainly not be considered as effective as brushing for a reasonable amount of time with a highly effective formula. While it is important to demonstrate the gum health benefits of the new formulations, a demonstration of the anticaries effectiveness for each product is also essential.

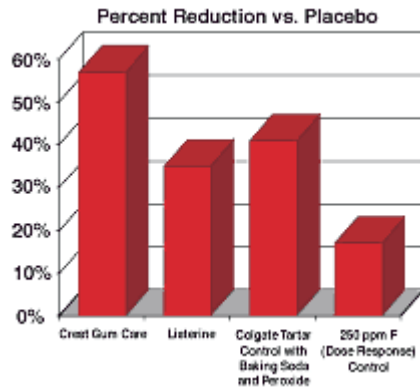
TEST PRODUCTS

Test Product	Fluoride Source	"Gum Health" Ingredient
Crest Gum Care	SnF ₂	Stannous Fluoride
Listerine®	SMFP	Essential Oils
Colgate TC w/ BS & Peroxide®	SMFP	Baking Soda/ Peroxide
Dose Response Control	NaF	-
Placebo	-	-

PROTOCOL

- **ANIMALS:** Harlan Sprague Dawley rats (22-23 days old)
- **ANIMALS PER GROUP:** 20
- **DIET:** High Cariogenic Diet #469 (63% granular sucrose, 32% non-fat dry milk, 2% liver powder, 3% cellulose) - food and water *ad libitum*
- **DENTIFRICE APPLICATION:** Cotton swabs, toothpaste diluted 1:1 with deionized water
- **TREATMENT PROTOCOL:** 2x/day/15 days (excluding Saturdays and Sundays).
- **SPECIMEN PREPARATION:** Upon completion of treatments, animals were sacrificed. Jaws were stained with 2% silver nitrate, then hemisected longitudinally
- **GRADING MAGNIFICATION:** 30X
- **TEETH GRADED:** First, second and third molars of each quadrant.
- **METHOD OF GRADING:** Each fissure was divided by an imaginary line through the middle of its bottom, and then each side of the fissure assigned a severity grade. Both halves of each quadrant were graded and the most severe grade recorded for each corresponding smooth surface or half-fissure. Severity was based on a 0-3 scale, with 0 representing no stain in the enamel or dentin, 1=dark brown stain in enamel only, 2=dark brown stain in enamel extending to the dentin/enamel junction, and 3=stain through the enamel and into the dentin.
- **TOTAL SEVERITY SCORE:** Smooth-surface and half-fissure grades for each animal in the group were totaled. A mean caries severity score (x HMA) was then calculated.
- **CALCULATION OF PERCENT REDUCTION:** Determined by subtracting the test group score from the placebo control group score, dividing by the placebo group score, and converting to percent.
- **STATISTICAL ANALYSES:** Standard ANOVA testing. Treatments were ranked by a Duncan's Multiple Range Test analysis.

RESULTS



CONCLUSION

The results of this study suggest that, under the conditions of this test, significant differences in anticaries efficacy are evident when comparing marketed fluoride toothpastes that are intended to maintain healthy mouths and gums.

Among the healthy mouth/healthy gum dentifrices tested, Crest Gum Care provided the highest level of anticaries efficacy.