



Chrisal
Test: PIP Toothbrush *Germ*
Controller


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1. Introduction

Through a practice test ordered by Chrisal, samples of the toothbrushes were compared one another in order to verify the microbial effect of probiotic treatment.

2. Materials and methods

2.1. Testing method

During several weeks, the effect of using 'PIP toothbrush *Germ Controller*' was monitored. The test group was divided in two, one group would use 'PIP toothbrush *Germ Controller*', another group didn't used the product (=control group).

Samples were taken once a week, just before a next cleaning of the teeth. Approximately 24hours after the last cleaning.

The samples were analyzed for total count, Enterobacteriaceae and Staphylococcus aureus (=MRSA bacteria).


- Total bacteria count: a measure for the general germ burden and probiotic presence.
- Enterobacteriaceae: indication for general hygiene of the material.
- S. aureus: a measure for the presence of pathogens.

2.2. Sampling

Samples of the toothbrush were taken by vortexing (=shaking) it in 10ml of sterile physiological water. 50µl of this suspension was tested using following media:

- Nutrient agar (oxid): Total count
- BAIRD-PARKER-Agar (Merck): Staphylococcus aureus.
- MacCONKEY-Agar (Merck): Enterobacteriaceae.

The samples were incubated at the appropriate temperature, atmosphere and duration.

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3. Results

Tabel 1: test group using 'PIP Toothbrush Germ Controller'.


Test group using 'PIP Toothbrush Germ Controller'					
	CFU/ml	CFU/ml	CFU/ml	CFU/ml	CFU/ml
Week	1	2	3	4	5
Total Count at 28 °C	1000	36000	50000	36000	61000
Enterobacteriaceae at 37 °C	30	10	10	10	10
Staph. aureus at 37 °C	40	40	50	10	10

Tabel 2: Test group without using 'PIP Toothbrush Germ Controller'

Test group without using 'PIP Toothbrush Germ Controller'					
	CFU/ml	CFU/ml	CFU/ml	CFU/ml	CFU/ml
Week	1	2	3	4	5
Total Count at 28 °C	360	140	210	280	340
Enterobacteriaceae at 37 °C	15	10	60	120	10
Staph. aureus at 37 °C	60	10	180	10	50

After 5 weeks use of the 'PIP Toothbrush Germ Controller', the following conclusions can be taken:

- The colonization of the PIP bacteria is effective and is reflected in the rising total bacteria count.
- Although no Enterobacteriaceae were present after two weeks of using PIP, the detection limit is 10 CFU/ml. Compared to the control group the increase in the number of **Enterobacteriaceae is at average 67,5% lower on the probiotic version.**
- Also Staphylococcus aureus wasn't present anymore after 4 weeks, but the detection limit is 10 CFU/ml. Compared to the control group, the increase in the

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number of **Staphylococcus aureus** is at average **52% lower on the probiotic version.**

- Compared to control group, the probiotic version has a for more **stable micro flora**. The control group shows a lot of up and downs when it comes to Enterobacteriaceae and Staphylococcus.

Conclusion: Based on the tests carried out the results of using ‘PIP toothbrush *Germ Controller*’ show a strong beneficial effect. It can be deduced that the probiotic treatment produces a clear suppression of pathogen development and has a positive effect on hygiene. Because of the improved hygiene, the risk on dental caries has been lowered.

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