AKTION ZAHNFREUNDLICH

Criteria and test methods for the determination
the "tooth-friendly" properties of products
(V09.09.24)

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1. Principle

The "tooth-friendly" properties of foods and other products that are consumed for nutritional, cosmetic or medical purposes or for enjoyment and that come into contact with the teeth during ingestion are tested by means of an in vivo cariogenicity assessment and/or an invitro pH measurement (formerly the telemetry test). While cariogenicity tests are carried out exclusively in external testing facilities, pH tests can also be carried out in a standardised manner by the manufacturer before, if necessary, being verified by external testing facilities for the Toothfriendly campaign. You can find a selection of external test facilities under the heading "Testing facilities".

A product is considered "tooth-friendly" if it is classified as neither cariogenic nor erosive.

2. Assessment of cariogenic or erosive potential

Based on its ingredients, a product may first undergo an expert assessment to determine whether the product can be classified as "tooth-friendly". Following this assessment, the manufacturer can decide whether or not to have the product tested.

2.1 Evaluation of the cariogenic potential

The cariogenic potential of a product is evaluated in vivo by measuring the plaque pH in the oral cavity during and 30 minutes after consumption of the product using a pH electrode. With this method, the product is tested on healthy volunteers with three- to seven-day-old plaque on an electrode placed in a removable restorative dental appliance. This is surrounded by human enamel and positioned facing the healthy interdental surface of an adjacent natural tooth.

The plaque pH curve of a test product is determined by recording at least two pH values per minute. A product is considered not to exhibit a significant level of carcinogenic potential if it does not reduce the pH of the interdental plaque below 5.7 due to bacterial fermentation either during consumption or within a period of 30 minutes after consumption. The pH curve must clearly indicate the time of consumption of the test product and the 30-minute post-consumption period.

The proper functioning of the plaque pH meter and the plaque metabolism must be checked with each test by rinsing with 10 ml of a sucrose solution (10%) or by consuming a sugar-containing equivalent of the test product. This positive control must reduce the plaque pH to values below 5.

If a range of products with different flavours is to be evaluated, one product must be tested on at least four different subjects and each additional flavour must be tested on at least two different subjects. Exceptions to this general test requirement may be made for products that are essentially equivalent

in terms of their fermentability and the acidity of their ingredients to an already tested product from the same manufacturer.

The details of the plaque pH test are described in a standard operating procedure (SOP) that is followed by accredited testing facilities when performing such tests.

Requirements for the testing facilities / for implementation

The external inspection facilities must fulfil the following criteria:

- The head of the pH testing facility must have a university degree, preferably in dentistry. The testing facility must have adequately trained personnel to meet both the technical and administrative requirements.
- The test procedures must have been approved by an ethics committee.
- The testing facility must be able to consistently perform objective, reproducible and scientific plaque pH measurements.
- The testing facility must participate in the ring tests at its own expense. These tests are conducted blind and include pH measurements of interdental plaque and oral fluid using various test products from the Swiss Toothfriendly campaign.

2.2 Assessment of erosive potential

Products are considered non-erosive if the test solutions prepared as shown below have the following properties:

1) *pH value* ≥ 4.5

2) 4.5 > *pH value* ≥ 4.0
   and the total concentration of calcium (added or already contained)

is 0.02%

3) 4.0 > *pH value* ≥ 3.8
and the total concentration of calcium (added or already contained)
is 0.06%

4) 3.8 > *pH value* ≥ 3.6
and the total concentration of calcium (added or already contained)
is 0.1%

5) *pH value* < 3.6: the product is classified as erosive regardless of the calcium content

Testing methods

1. General rules

- The pH value of the test solutions, which are prepared as described below, is measured using a standard pH electrode at room temperature.
- The electrode must be calibrated immediately before the measurement. The calcium concentration is preferably analysed using standard atomic absorption with an atomic absorption spectrometer using an air/acetylene mixture.
- Lanthanum should be added to all products and standards to suppress interferences.
- The volume of the test solutions must be selected in such a way that a reproducible measurement is guaranteed.
- If water is added, distilled water is used.

Conversions: 1 ml = 1 g; 1 cup = 200 ml; 1 tablespoon = 15 ml; 1 teaspoon = 5

ml

2. Specific procedure

Products suspected of having erosive potential on dental hard tissue due to their acidic components must be tested as follows:

- Medicines and food supplements (tablets, powders, effervescent tablets, etc.) that enter the oral cavity in liquid form are dissolved in distilled water in accordance with the manufacturer's instructions. Products that are sucked are prepared as described below.
- Mineral water, carbonated water and other non-alcoholic beverages; fruit drinks, fruit juices and lemonades; syrups and other preparations for the preparation of beverages: are prepared with distilled water as indicated on the respective products. If no manufacturer's specifications are available (e.g. only specifications such as: x teaspoons / y sachets / z sticks per cup/glass/jug), volumes of 200 ml (for cups and glasses) and 1000 ml (for jugs) are used.
- Sweets and pastilles are dissolved in distilled water (10 g in 50 ml) at 45°C while stirring and then cooled to room temperature for the pH measurement. If necessary, the sweets are crushed.
- Chewing gum (10 g) is cut into pieces, if necessary, and then crushed in a mortar for 5 minutes. For this process, distilled water is added (< 50 ml). Before the pH measurement, the volume is supplemented with distilled water to a total of 50 ml.

3. Transitional provisions

The measurement procedure for testing tooth-friendly products was revised in September 2024. Products that were tested in accordance with the

previous procedure and bear the logo will remain "tooth-friendly" even without being tested again using the current procedure, provided that random sampling under the newly defined test procedure does not indicate non-compliance.

4. Possible external testing facilities

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