Sweeten Your Life With Xylitol!

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Northeast Xylitol Educator

Over View

- Oral Systemic Connection
- Biofilm
- Oral Disease
- General Health Benefits of Xylitol
- Dental Health Benefits of Xylitol
- Xlear/Spry Products

Oral disease is transmissible!!!

Mother Child Study

Mothers used xylitol gum from 3 to 24 months after delivery.
Control groups received either fluoride or chlorhexidine varnishes.
At 24 months of age, children of mothers who received xylitol 1)
Chlorhexidine varnish: 3x more SM than xylitol
2) Fluoride varnish: 5x more SM than xylitol.
Mothers who use xylitol gum are less likely to transmit familial MS bacteria to their children.

Dental decay in children after maternal consumption of xylitol chewing gum

75-80% suffer from some form of gum disease and mouth sores

Xylitol and Periodontal Pathogens

Xylitol, an Anti-caries Agent, Exhibits Potent Inhibition of Inflammatory Responses in Human THP-1-derived Macrophages Infected With Porphyromonas Gingivalis

Park T, No HI, Kim SM, Walker S, Che S, Chong J.
Xylitol and Periodontitis

"These findings suggest that xylitol may have good clinical effect not only for caries but also for periodontitis by its inhibitory effect on the LPS-induced inflammatory cytokine expression."

"This Korean study also showed that xylitol inhibits the growth of P. gingivalis, an important periodontal pathogen."

Xylitol, Root Decay, and Gingival Health

- Adv Dental Research
  "Along with reductions in occurrence of root surface caries, xylitol use also improved gingival health."

- Special Care Dentistry
  "Xylitol use also stimulated saliva, improved gingival health, and even help reduced cravings for cigarettes in several smokers."

Cheeks and tongue

Xylitol and Oral Candida

Microbial Ecology in Health

"C. albicans grown in galactose elicited maximal increase in adhesion followed by glucose and sucrose. Maltose and fructose also promoted adherence of Candida. Xylitol significantly reduced adherence of Candida to BECs. (buccal epithelial cells) The dietary carbohydrates, therefore, can represent a risk factor for oral candidiasis. The limitation of their consumption by substituting xylitol could be of value in the control of oral Candida colonization and infection." Microbial Ecology in Health and Disease vol. 17, no. 3, pp. 156-162, 2005.

Treatment for Oral Candidiasis

Lips

Tooth decay: #1 infectious disease affecting children

CLINICAL EVIDENCE FOR XYLITOLʼS ANTI-CARIOGENIC EFFECTS

Belize City Xylitol Chewing Gum Study 1989-1994
- University of Michigan
- 1277 students
- 4 xylitol groups

Children chewing 100% xylitol sweetened gum experienced the most dramatic decrease in tooth decay

Belize City Xylitol Chewing Gum Study
Follow up data collected by the University of Washington Dental School 5 years after the initial study. Subjects in the xylitol group had over a 70% reduction in tooth decay 5 years after the study. Xylitol changes the micro-flora of the mouth. Inhospitable for Strep Mutans.
Remineralization with Xylitol

28 month use of xylitol
Dentin is hard
Dentin exhibits scratches with an explorer

Oral health

Oral health + Sinus health

The Gateway to the Body

Xylitol has been the subject of over 2000 research projects

What is xylitol?

Xylitol is a natural sweetener
Xylitol was **re-discovered** in 1891 by Dr. Emil Fisher.

Xylitol production began in Finland during WWII.

**CLINICAL EVIDENCE FOR XYLITOL’S ANTI-CARIOSGENIC EFFECTS**

Plaque Formation After Chewing Xylitol Gum or Sucrose Gum

*University of Turku, Finland*

**Turku Chewing Gum Study**

**Enter: Xylitol**

*5 Carbon structure of xylitol and manitol*

*5 Carbon structure of xylitol*

All Strep (including Staph and MRSA)

Candida Albicans (Fungus)

Influenza

Xylitol is a 5 Carbon Polyol

2.5% and 5% Xylitol Markedly Reduced The Growth of Alpha-Hemolytic Strep, Including S. pneumonia, H. Influenza, and M. catarralis

These findings were published in the *British Medical Journal* in 1996 and the journal *Pediatrics* in 1998.

Strep Mutans and Simple Sugar:

Strep Mutan and Xylitol:

He concluded xylitol could reduce the carriage of this pathogen.

Xylitol could have clinical significance in the prevention of pneumococcal disease without counteracting the body’s defense system.
Which Causes Less Decay?

Biofilm and xylitol

Crystalline structure of xylitol

Fig 1 CLSM image of intact biofilm
Fig 2 CLSM image of biofilm treated with xylitol at 3% concentration.


Fig 1

**Glucose metabolism**

**Where does Xylitol Come From?**

Xylan + Water + Hydrogen = Xylitol

**Why should we use xylitol?**

**GENERAL HEALTH**

**TOP 10 UNSAFE FOODS FOR DOGS**

<table>
<thead>
<tr>
<th>Chocolate</th>
<th>Coffee</th>
<th>Collagen</th>
<th>Yeast</th>
<th>Macadamia Nuts</th>
<th>Grapes/Grapes</th>
<th>Yeast Dough</th>
<th>Rose petals</th>
<th>Eggs/Bones</th>
</tr>
</thead>
</table>

**Xylitol is Not safe for DOGS**
Replace Sugar (Sucrose): Not So Sweet!!!

The Average American consumes 158 lbs of Sugar (Natural, Refined and High-Fructose corn syrup) every year.

4 Grams of Carbohydrate = 1 teaspoon of sugar

American Heart Association Sugar Intake Guidelines

<table>
<thead>
<tr>
<th>Gender</th>
<th>Added Grams</th>
<th>Daily Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women</td>
<td>20</td>
<td>5 tsp/day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>80 calories</td>
</tr>
<tr>
<td>Men</td>
<td>36</td>
<td>9 tsp/day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>144 calories</td>
</tr>
<tr>
<td>Children</td>
<td>12</td>
<td>3 tsp/day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>48 calories</td>
</tr>
</tbody>
</table>

Down side of refined sugars

- Stimulates the release of Dopamine (pleasure) in the brain...addiction
- The more sugar we take in the less essential micronutrients we take in.
- Obesity
- Cells become Insulin Resistant
- Increase in type 2 diabetes
- Impaired Immunity
- Depression
- Hypertension
- Osteoporosis
- Premenstrual Syndrome
- Chronic Inflammation
- CVD...low HDL/modify LDL
- Rise in Triglycerides

High Fructose Corn Syrup

人工甜味剂

- 人工香料
- 人工甜味剂

Class Act Lawsuits for False Advertising

July 2015 Consumer group in New York: U.S. Right To Know (USTRK) Petitioned FDA and FTA to investigate CocaCola Co., PepsiCo Co., Dr pepper Snapple Group, and Dr Pepper/Seven Up Inc. for misbranding their products as "DIET": Illegal claims that its artificially sweetened sodas prevent, mitigate, or treat obesity.

In October 16, 2017 three separate class action suits were filed against these companies.

Defendants deny allegations and say they will fight it.

Natural Sugar Taste vs Artificial Aftertaste

Xylitol is great for cooking and sweetening foods
Xylitol Acts as a Prebiotic...

**What is a Prebiotic?**
- Foundational piece of the non-inflammatory Diet (Functional Foods) to reduce inflammation and host of disease.
- Foods (Soluble fiber) that pass through the stomach and small intestine intact and are broken down only by healthy gut bacteria in the Colon.
- Three Types: Inulin (Fruits and veg), oligosaccharides (Cocoa), and Xylitol (Xylitol and arabinogalactans (Shiitake).

**Prebiotic Foods**
- Garlic
- Onions
- Leeks
- Chicory root
- Asparagus
- Bananas
- Barley
- Oats
- Apples
- Cocoa
- Flaxseeds
- Jicama Root
- Wheat Bran
- Seaweed
- Xylitol

**What is the function of a PreBiotic?**
- Healthy Gut bacteria when metabolizing "non-digestible foods" they produce fatty chain acids that aid in absorption of water, sodium, calcium and other important minerals.
- Lowers pH in gut to about 6.7-6.9 which supports the good bacteria.
- Promote a sense of fullness
- Reduce Glycation which releases free radicals
- Reduces Inflammation
- Sets up an environment for the Good Gut Bacteria to proliferate.

**Prebiotics aid in preventing and reversing inflammation that lead to:**
- Obesity
- Cancer
- Hypertension
- Inflammatory bowel disease
- Diabetes
- Constipation
- Cardiovascular disorders
- Diabetes
- Hypercholesterolaemia
- Various allergies

**What is a ProBiotic?**
- Healthy Living Organisms in our small intestine: Lactobacillus and Bifidobacterium
- Fermented foods: Kombucha, Yogurt, Sauerkraut, Kefir, Pickled Vegetables.
- Increases Digestive Enzymes
- Helps body produce acetylcholine
- Improves Pancreatic function
- Inhibits growth of unwanted pathogens

**What negatively effects our good belly bugs?**
- Environmental chemicals and certain foods such as: Chlorine (antibacterial), Glyphosate, Pesticides, Sugar, Gluten, and Antibiotics
- Lack of nutrients that support good healthy bacteria and feed the bad.
- Stress: Physical and Mental

**Leaky Gut**
- Cell membrane of the intestines are 1 cell thick with interlocking fibers to hold them together
- This keeps pathogens, food molecules and chemicals contained within the intestines to be excreted.
- Allows for absorption of nutrients from food.
- When the Gut is unhealthy the interlocking fibers break and spaces are formed between the cells that allow leakage to occur into the blood system.
- Our immune system is directly affected and a chronic inflammatory response occurs which effects all organs.

**Xylitol is an emerging PreBiotic**
- Xylitol promotes the growth of probiotics like Lactobacillus and Bifidobacteria by altering the colonic microflora.
- It also reduces the chances of intestinal infection by reducing the growth of putrefactive bacteria (Clostridium perfringens) and pathogenic bacteria (Salmonella, Shigella, Listeria, Escherichia coli, Clostridium difficile).
- Xylitol reduces the growth of opportunistic pathogens (Escherichia coli, Candida albicans) through competition for growth medium and adhesive area.
- Xylitol improves metabolism of glucose, lipid and cholesterol.
- The fiber like properties of xylitol reduces the formation of ammonia and other end products of protein catabolism. These attributes may contribute to reduction in the risk of colon carcinogenesis. It also improves the availability of essential minerals and production of vitamin (B1, B6, B12 and folic acid).

**Xylitol is an emerging PreBiotic**
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- Reduces Inflammation
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What Can Cause a Leaky Gut?

Diet:
- Gluten
- Soy
- Dairy
- GMO Foods
- Refined Sugar/Caffeine/Alcohol

Medications:
- Antibiotics
- Steroids
- Aspirin
- Acetaminophen

Signs of a Leaky Gut

- Chronic diarrhea, constipation, gas or bloating
- Nutritional deficiencies
- Poor immune system
- Headaches, brain fog, memory loss
- Excessive fatigue
- Skin rashes and problems such as acne, eczema or rosacea
- Cravings for sugar or carbs
- Arthritis or joint pain
- Depression, anxiety, ADD, ADHD
- Autoimmune diseases such as rheumatoid arthritis, lupus, celiac disease or Crohn's

Leaky Gut Related Illnesses

- Immune System Function
- Gene Expression
- Diabetes
- Obesity
- Parkinson's
- Alzheimer's
- Depression
- MS
- Cardiovascular Disease
- ALS?
Psychobiotics
Prebiotics
Probiotics
Non inflammatory Diet
Exercise

Non Inflammatory Diet
- Raw or cooked Vegetables
- Fresh fruit

Fecal microbiota Transplant
- Currently approved in US for C-Dif
- United Kingdom provides treatment with success for MS and Parkinson’s.

Recommended Reading

Where are we heading?
“Gaining just 11-16 pounds doubles the risk of type 2 diabetes, while gaining 17-24 pounds triples the risk.”

“One in three children born today will have diabetes in their lifetime”

“The number of diabetics will increase from 1 in 10 Americans today to 1 in 3 by the middle of this century.”

Xylitol is safe for diabetic patients

The Diabetic Dental Patient
Periodontal problems
- Salivary Gland Dysfunction
  - Dry mouth
  - gland enlargement
  - sialoliths
  - gland infections
- Increased incidence of candida infections
- Increased incidence of decay (salivary decrease)
- Decreased healing time

Prepared by F Varon, R Geist and the AADOM Web Writing Group
Updated 31 December 2007
40% fewer calories – great for weight loss

Xylitol prevents ear infections in children

Xylitol 3 times a day is not effective in preventing otitis media


Xylitol 5 times a day prevents otitis media


Xylitol and Pediatricians

“Only about half of the pediatricians surveyed knew about medical uses of xylitol. “Future research should focus on prevention and the use of xylitol as a possible prophylaxis regimen for Acute Otitis Media in patients.”


Xylitol prevents upper respiratory problems

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How does Xlear work?

Usage: 2 x a day for prevention or every 3-4 hours for treatment of infection or allergies

Xlear Nasal Spray Sample

• Spray and sniff
• Blow
• Spray and sniff

How does Xlear work?

How does Xlear work?
Nose Breathing vs Mouth Breathing

Why should dentistry be concerned with respiratory health?

- Blocked nasal passages lead to mouth breathing
- Mouth breathing leads to dry mouth
- Dry mouth leads to decay
- Mouth breathing can also lead to developmental issues with the teeth and jaws
- Medication induced xerostomia

Catch ‘em while their Young!!!!

Amazing Testimony
How do your nasal passages feel...Can you breathe???

More Uses of Xylitol

Xylitol, facial wash and acne
- 4 ounces of facial wash (any kind)
- 1 tablespoon of xylitol granules
- Use twice daily

Xylitol is being researched in wound clinics

DENTAL HEALTH

Research: Dental Benefits
Prevents oral bacteria from sticking to the teeth and gums

Dental Benefits
Biofilm Buster
Hydrates Mouth
Neutralizes pH
Assists in Remineralization

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Biofilm Buster
Hydrates the Mouth
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Besides these glands, there are many tiny glands called minor salivary glands located in your lips, inner buccal mucosa, and extensively in other linings of your mouth and throat.

Saliva production is controlled by the autonomic nervous system. Saliva is released at all times of the day and night, although its peak production occurs when you taste, smell and think of food. When healthy, you produce 2 or 3 pints of saliva per day, which equals almost 10,000 gallons in your lifetime.

Risk Factors for Dry Mouth

- Medication
- Chemotherapy
- Elderly

The Beauty Of Saliva

- Buffering capacity/balances the pH
- Rinses away food debris and creates a bolus to comfortably swallow.
- Facilitates taste and aids in the breakdown of food
- Provides protection against infection
- Lubricates inside cheeks, lips and tongue/prevents cheek biting

Did You Know Dry Mouth Victims...

- Cannot taste food?
- Have cheek biting issues?
- Cannot eat without food particles breaking up and sticking to soft tissue?
- Must cough to unstick the nasopharynx?
- Wake up every hour in the night due to the tongue sticking to the palate?
• Rely on sipping water which only dries out soft tissues?
• Cannot use peppermint or cinnamon
• Have increased caries, mucosal, and lip infections?
• Need an array of products to choose from throughout the day and night?
• Have difficulty Kissing!

“Just Drink More Water”

Enter Xylitol

Xylitol Attracts Moisture

Xylitol increases salivary secretion rate and decreases feeling of dry mouth.

Xylitol attracts moisture

What Can Patients Do For Relief?

Nasal Spray

Rain Mist

Dental Gel

“Just Drink More Water”

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Nasal Spray

Rain Mist

Dental Gel
Dry Mouth Relief System

Xlear Nasal Spray: Spray 1-2 times into each nostril before bedtime and as needed during the day to moisturize the throat and nasal passages.

Oral Mist: Spray into mouth as often as needed to moisturize tissues.

Spry Tooth Gel: Finger swipe onto tongue and inside cheeks before meals and bedtime, or as often as needed.

Adjunctive Dry Mouth Relief Products

Spry Gum: Spearmint, Fruit, Green Tea
Chew 2 pieces after each meal, 3-5 minutes

Spry Mints: Lemon, Berry, Spearmint
Dissolve 3 pieces after each meal

Spark Candies: Berry, Fruit
Dissolve 6 pieces after every meal

Xylosweet: One 4 gram packet in 16 oz water
Sip during meal

Dental Benefits

Biofilm Buster
Hydrates the Mouth
Neutralizes pH
Assists in Remineralization

Xylitol Neutralizes Acids
Neutralizes the acids produced by the fermentation of carbohydrates

Dental Benefits

Biofilm Buster
Hydrates the Mouth
Neutralizes pH
Remineralizes Teeth

Xylitol increases Remineralization:

Xylitol Promotes Remineralization

“Xylitol can induce remineralization of deeper layers of demineralized enamel by facilitating Ca++ movement and accessibility.”

So Now What?

STRIVE FOR FIVE

XYLITOL PROTOCOL

Microhardness of demineralized enamel increased when
20g xylitol was used for 10 days

“Strive for Five”

**XYLITOL PROTOCOL**

**Morning**
1. Brush with Xylitol toothpaste and Rinse with Xylitol mouth rinse

**After breakfast**
2. Chew 2 pieces xylitol gum OR suck on 3 xylitol mints

**After lunch**
2. Chew 2 pieces xylitol gum OR suck on 3 xylitol mints

**After dinner**
2. Chew 2 pieces xylitol gum OR suck on 3 xylitol mints

**Before Bed**
5. Brush with Xylitol toothpaste and Rinse with Xylitol mouth rinse

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Canker Sores

Angular Chelitis

Candidiasis
Preparing Your Patient for Oncology Treatment

Preparing the Mouth
To prevent candida infections.
To promote healthy flora.
To keep sinuses and nasal passages healthy – their immune systems become depressed.
Systemic xylitol as sweetener alternative to keep blood sugars/insulin under control.

Nursing Home Research
Researchers:
Angie Stone, RDH, BS
Shirley Gutkowski, RDH, BSDH, FACE

SPECIAL NEEDS

15 year-old male
Diagnosed with PDD
At initial visit completed a full mouth scaling and placed on a Xylitol Gum Regimen...2 pieces/5min/5x a day

4 Week Follow-Up Visit

Special Needs
Dental Benefits
Biofilm Buster
Hydrates the Mouth
Neutralizes pH
Remineralizes Teeth

Xylitol is Not safe for DOGS

Xylitol consumption requires a tolerance period!
The amount of xylitol needed for dental benefits will NOT give unwanted effects
Threshold in GRAMS/DAY
Children: 45
Adults: 150-200

Where Can Xylitol Be Found?

Spry Dental Defense
Quality Xylitol Products are only found in Health food Stores

Xlear Nasal Spray

Spry Dental System Toothpaste

Spry Oral Rinse

Alcohol Free Mouthwash

Spry Dental Floss

In Between Meals Gum

Spry Gum

Spry Gems