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# Tooth Building Foods

MARY A. DOLVE

Extension Nutritionist

What the family members are eating is largely a matter of habit formation and training. This fact was clearly brought out at 24 county food program determination meetings and the summary of the state homemakers survey.<sup>1</sup>

The homemakers survey included 1617 returned health questionnaires from 37 counties and 1242 returned food questionnaires from 24 counties.

## Brookings County Study<sup>2</sup>

Professor W. F. Kumlein of the Rural Sociology Department of State College, Brookings, S. D., has just completed a health survey conducted in Brookings Co. All homes in four townships were visited, Argo, Oak-

wood, Oslo and Parnell, including two towns, Sinai and Bruce. In all 483 homes were visited. Questions were asked pertaining to health, food and food practices to serve as a check on the State homemakers survey.<sup>1</sup> The facts obtained from the two studies are quite similar. Obtaining the information by a personal visit no doubt gave more accurate information than where the homemakers filled out the questionnaires at a meeting.

In applying the meal planning score card as a measuring stick it is found that there is a 74 percent efficiency in the winter and 63 percent efficiency in the summer in food selection. On the average 2.1 quarts of milk are used daily per family in the four townships. To come up to the standard dietary the average family in the study (1.7 adult, 2.5 children) should use 3.35 quarts of milk daily.<sup>3</sup> The amount used falls short 1.25 quarts or 37 percent of the amount recommended in the standard dietary.



Fig. 1 Food is a big factor in well developed and evenly spaced teeth. (S. Dak. State and National 4-H Club health champion, 1928.)

<sup>1</sup>The homemakers survey was conducted by Susan Z. Wilder and Mary A. Dolve, Extension Nutritionists, State College, Brookings, S. Dak. The home agents cooperated by getting home extension club members, dentists, doctors and grocerymen to fill out questionnaires. The homemakers questionnaires were filled out at club meetings. The questionnaires were summarized at the State College.<sup>2</sup> The summary findings have not been published to date.<sup>3</sup> This amount is based on a quart for each child and a pint for each adult of the average family included in the study.

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Thirty-two percent of these 483 homemakers said children were fussy about their food; 13 percent that they had difficulty in getting children to eat vegetables; and eighteen percent that they had difficulty in getting children to drink milk.

**TABLE I**  
**Dietary of Average Homemaker in Brookings County Study**  
**Compared With Standard Dietary**

	Standard dietary in servings a day	Brookings Co. dietary in servings in a day		Deficiency in servings and percent			
		Winter	Summer	Winter		Summer	
				Serv'gs	Pct.	Serv'gs	Pct.
Vegetables other than potatoes	2	1.08	1.5	.92	46	.5	25
Leafy vegetables	1	.01	.01	.99	99	.99	99
Fruit	2	1.25	1.25	.75	37	.95	47
Raw fruit, vegetables or tomatoes	1	1.05	1.24	*	*	*	*
Meat, eggs and fish	1 generous	1.55	1.44	*	*	*	*
Whole cereals	1.5	1.15	.32	.35	20	1.18	78
Milk	3.35 qts.	2.1 qts.	2.1 qts.	1.25	37	1.25	37

**TABLE II**  
**Food Dislikes of 1207 Children and 821 Adults Represented**  
**in the Brookings County Study**

Food	Percent of those usually not eating foods when served		Food	Percent of those usually not eating foods when served	
	Adults	Children		Adults	Children
Lettuce	35	40	Cooked vegetables	15	27
Raw cabbage	17	36	Greens	43	64
Tomatoes	14	34	Milk	24	33
Celery	49	52	Cooked cereal	20	29

The Brookings county study like the State homemakers survey indicates that the principle inadequacy of the diet centers around the vegetables and milk.

### Food A Factor In Tooth Development

Dentists cooperated in the State survey by filling out questionnaires. The consensus of opinion of dentists interviewed is that food habits are important factors in tooth development. A few statements made by some of the dentists follow:

"As a rule I can pick out the children who eat enough milk and vegetables."

"Proper food is the only known factor to determine teeth development."

"Very important that foods containing a high calcium content should be insisted upon."

"The importance of first or six years molars should be emphasized to parents and taught by teachers as it is the key to the permanent arch and is so often lost by early neglect or ignorance."

"People don't have to lose teeth at a certain age. It is up to you how long you have teeth. Nutrition is the main thing as far as teeth are concerned."

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"Sixty percent of tooth difficulties could have been eliminated if proper nourishment and care of teeth had been observed at all times."

"One mother who lost 19 teeth from decay with her first child was under the dentist's care when she was carrying the second child and had proper food (milk and vegetables) and did not lose a tooth."

"There is just as much harm in extracting baby teeth too early as there is in leaving them in too long. The baby teeth guide the permanent teeth into place and cause pressure on the jaw bone. If these teeth are extracted the proper growth of the jaw stops."

"Mothers should go to the dentist while carrying children. He can take care of her teeth and advise her about her food."

TABLE III

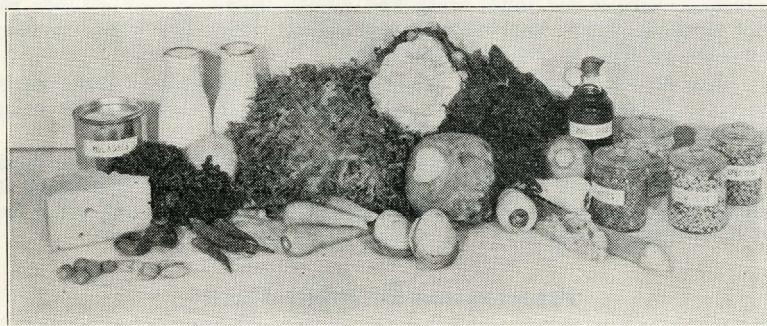
Extent of Poorly Developed Teeth and Type of Dental Work Done as Indicated by Summary of Dentists Questionnaires<sup>1</sup>

	PERCENT		TYPE OF DENTAL WORK DONE IN PERCENT						
	Have poorly developed teeth	Have periodic dental Exam.	Prevention			Repair			
			Inspection	Cleaned	Total	Fill'g	Extract'n	False	Tot.
Children	35	27	22	17	39	28	27	6	61
Adults	34	18	18	15	33	20	29	18	67

If food habits are as big a factor in tooth development as the dentists maintain it would naturally follow that the basic dental prevention work is to get good food habits established in the family especially among the children. Habit formation is a parental education problem (see p. 4 Extension Circular, No. 288, Good Food Habits For the Family.)

The food habits having a bearing on good tooth development are liking and eating foods containing an ample supply of the tooth building materials: calcium (see Fig. 2), phosphorous (see Fig. 6), other essen-

Fig. 2. Foods rich in calcium, a tooth building material. Homemakers survey shows that too little of these foods are used.



(U. S. Bureau Home Economics.)

Almonds  
Beans, dry  
Buttermilk  
Cabbage greens  
Carrots  
Cauliflower

Chard  
Cheese, American  
Clams  
Cowpeas  
Dandelion greens  
Endive

Figs, dry  
Hazelnuts  
Kohl-rabi  
Lentils  
Maple syrup  
Milk

Molasses  
Okra  
Oranges  
Parsnips  
Peas, dry  
Rhubarb

Rutabagas  
Spinach  
Turnips  
Turnip tops  
Watercress

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tial minerals, vitamin D (see Fig. 3), and foods causing chewing for exercise. Milk heads the list of all foods supplying calcium and should be relied on chiefly for calcium all through the growing period. Vegetables contain enough calcium to be of importance.

### Feed Your Teeth

It takes the body about 18 years to build the teeth which are to serve for a life time; 52 in all, 20 in the first set and 32 in the second set. The first teeth begin to develop during the third month of prenatal life and the second set is not completely formed until about the eighteenth year.

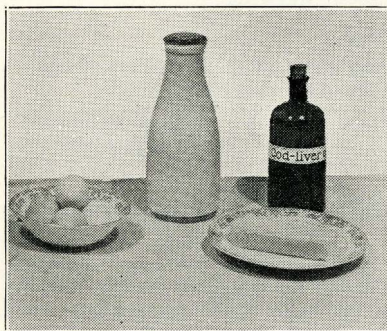


Fig. 3. Foods Rich in Vitamin D

Cod-liver oil  
Egg yolks

Butter  
Milk

A tooth like any other part of the body needs certain foods to first build it up and second to keep it in good repair. In examining a tooth carefully it is found that in the center are numerous fine blood vessels to carry that tooth's food supply.

The building material for teeth is largely calcium and phosphorous. Vitamin D is necessary to secure calcium and phosphorous from the blood stream in sufficient amounts for the best calcification or bone growth.

Cod-liver oil is the richest source of vitamin D; egg yolks have considerable; important amounts are found in milk and butter. Sunshine playing directly on the body produces vitamin D in the skin.

Foods not only supply the building material for the teeth but also the necessary exercise for jaws, teeth and gums. Hard or coarse foods require chewing which improves the circulation about the roots, thereby aiding the general nutrition of the teeth.

Foods especially good for exercise are raw vegetables and fruits, whole grain products, and crisp foods such as toast, zwiebach, rye crisp and flat bread. (Norwegian bread).

The recommended standard dietary contains the foods needed for tooth building and exercise for the normal tooth development. (See page 4, Extension Circular 288, Good Food Habits For the Family and other references listed on page 8.)

### Preservation Of Adult Teeth

Dental authorities have evidence to prove that foods and thorough mastication can maintain as well as develop good teeth, and that the enamel and dentine can be improved in adults. The vitality of the teeth and the health of the surrounding tissues can be influenced by:

1. Continuing to use foods emphasized for tooth development, especially milk.

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2. Using generously raw fruits and vegetables because of their natural cleaning and polishing effect on the teeth and the essential vitamins and minerals they supply.



Fig. 4. Deformity and improper closing of permanent teeth, due to premature loss of first molars, (R. C. Willett Journ. Am. Dental Ass'n.)

Many people considered homely would be good looking were it not for their unsightly mouths caused by irregular and misplaced teeth. Irregular teeth are not inherited, but in the vast majority of cases could have been prevented. Some of the prevalent causes are given below so that by careful study children in the future may be saved from a facial deformity.

1. The loss of baby teeth before it is time for second ones to take their place. (See Fig. 4). The baby tooth holds the room in the jaw for the second tooth. When the baby tooth is lost some time before the second one is ready to take its place the space where it was closes. When the second tooth comes in it must take a position out of line with the teeth or become badly turned. Take care of the baby teeth; they affect the second teeth.

2. The loss of permanent teeth, especially the six year molars. The six year molars are the most important of the permanent teeth as they hold the jaws in proper position and do all the chewing of food while the first teeth in front of them are shed. These molars normally keep the jaws in the proper relationship while the temporary teeth are being shed, but often they are not recognized as permanent teeth

3. Using a goodly proportion of whole grain products.

4. Chewing thoroughly all foods and using daily more hard foods which require mastication.

5. Cleaning teeth at least twice a day; upon arising and before going to bed.

6. Cleaning and inspection once or twice a year by a good dentist.

### Causes of Uneven Teeth

It is not uncommon to hear someone remarking about the even or straight teeth of some person. If nature were not hindered in so many ways irregular teeth would become uncommon and would be regarded as much of a deformity, as cross-eyes or bow-legs.

Normally the teeth of the upper jaw strike a little outside of the lower teeth and practically every tooth strikes against two other teeth. Normal occlusion is the correct way the teeth of one jaw mesh with the teeth of the opposite jaw and any perversion of this relationship is termed malocclusion.



and are neglected. Every mother should learn to recognize the six year molars. It is the sixth tooth from the center, front. They are the four large double teeth that come through the gums behind the baby teeth.

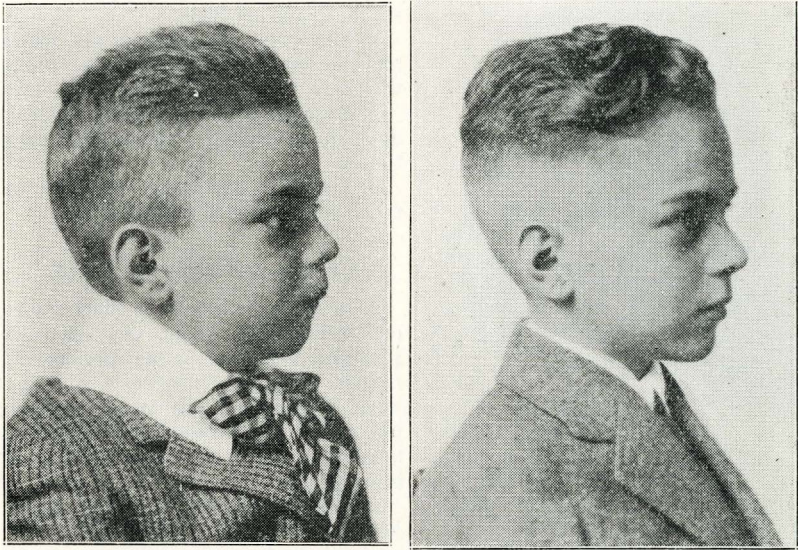


Fig. 5. Improper closing of permanent teeth, due to early mouth-breathing and premature decay of temporary teeth. Same boy after teeth had been straightened by long and expensive treatment. (R. C. Willett, Journ. Am. Dental Ass'n.)

3. Failure to give jaws, teeth, and gums exercise by eating hard foods and to chew foods long enough. Failure to provide hard coarse foods that require thorough chewing is a very common cause of under development of the jaws, causing crowding and irregularity of the permanent teeth. Children fed foods which require little or no chewing fail to develop the muscles and bones of the face because of lack of use. It is common knowledge that a muscle grows if it is used a great deal. A bone to which a used muscle is attached will also grow larger. When the muscles of the jaws are used to chew hard foods the jaw bones themselves are made to grow and room is thus obtained for the large second teeth.

4. Breathing through the mouth. (See Fig. 5). The bones of the face during childhood are relatively soft and pliable. If a child breathes with the mouth open the constant tension of the muscles against the bones of the face causes enough pressure to deform them. Mouth breathing is often caused by adenoids which stop up the air passage and force the child to breathe through the mouth. If a child sleeps with his mouth open or breathes through his mouth when awake, a competent doctor should be consulted.

5. Bad habits. The most common habit is sucking fingers or thumbs. The pressure of the fingers in the mouth and the force exerted in sucking causes many bad deformities.

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Many mouths have been ruined by the hard rubber comforter or pacifier.

The results of these habits are often not noticable to the lay observer when looking at the temporary teeth and it is often difficult to make parents realize that harm is being done.

### Summary

Some of the most outstanding facts brought out in the survey: The prevalence of poorly developed and rapidly decaying teeth; that all dentists interviewed feel that food is a most important factor in tooth development; that the deficiency in the diet centers around the food groups (milk and vegetables) especially valuable in supplying the minerals and vitamins for teeth and bone growth.

If the diet contains all the bone and tooth building materials in ample quantity and food requiring thorough mastication and no pernicious habits are allowed to be formed, nature can usually be depended upon, if unhindered, to produce a regular and lasting set of teeth.

Strong healthy teeth are the result of:

1. Good Nutrition with special emphasis on attention to health and proper food of: Mother-expectant-nursing. Child-preschool-school.
2. Thorough mastication: First aid to good digestion. Necessary for jaw development in early life and for maintaining health of teeth surrounding tissues through life.
3. Adequate prophylactic and dental care: Cleaning of teeth upon arising and before retiring. Clean child's teeth as soon as they appear. Regular visits to dentists beginning about two and one-half years of age.

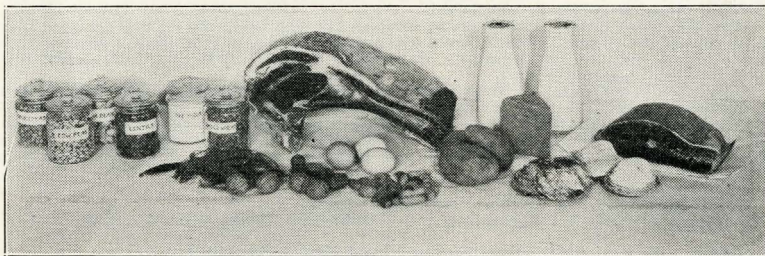
### TOOTH BUILDING FOODS PREPARED SO YOU WILL LIKE THEM

Milk is the best tooth building food. For recipes see Extension Circular 277, Milk The Growth For Health.

### Cooking Of Vegetables

1. Boil water several minutes to drive out air before putting vegetables in. Bring back to boil as rapidly as possible.
2. Cook at first with lid ajar or off. For strong flavored, green or yellow vegetables leave lid off during cooking to allow acids and gasses to escape.
3. Add salt early if color is to be increased (1 teaspoon salt to 1 quart of water); exceptions are red and white vegetables.
4. Use just enough water to cover mild flavored vegetables such as peas, celery, carrots, string beans. Do not drain: let water cook down.
5. Boil rapidly strong flavored vegetables (such as cabbage, cauliflower, brussel sprouts, onions, turnips and asparagus) in larger volume of water. Drain. Sometimes it is desirable to change water. When young and more mildly flavored cook as mild flavored vegetables.
6. Cook spinach with no water added. Place in kettle directly from last washing, pour off water that drains to bottom of kettle. Use low heat to wilt greens during heating. Add salt, careful not to overcook. Cooking with lid off for few minutes is generally enough. Most greens can be cooked this way. Some may require more water or a separate cooking of stems. Mustard greens may require cooking as strong vegetables.

Fig. 6. Foods rich in phosphorus



(U. S. Bureau Home Economics.)

Almonds	Eggs	Meat, lean	Peas, dry and fresh
Beans, dry	Fish	Milk	Shredded wheat
Beans, lima, fresh	Graham flour	Oysters	Walnuts
Buttermilk	Rye flour	Peanuts	Whole wheat
Cheese	Hazelnuts	Pecans	Wheat, bran
Cowpeas	Lentils	Tomatoes	

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7. Cook vegetables till done and no longer (for most vegetables 10-25 minutes of actual boiling is enough). Overcooking destroys: coloring, pleasant flavor, and vitamins.
8. Add no soda in cooking vegetables (exception-navy beans). Injures flavor, texture, and vitamins.
9. Steam mild flavored white, yellow or red vegetables (parsnips, carrots, sweet potatoes, squash, beets) if preferred. If strong flavored or green vegetables are steamed raise cover once or twice to allow steam to escape during early part of steaming.
10. Serve any vegetables while hot or reheat it with: Butter, cream, milk and butter, white sauce poured over or escalloped with layers of sauce.

#### GREENS MAY BE VARIED:

When boiled the leaves may be cut across several times and served one of following ways.

1. With melted butter, ham, bacon or other tasty fryings poured over them.
2. Cold with salad dressing, garnished with hard cooked eggs.
3. Hot with cream or white sauce.
4. Hot as Dutch greens with following sauce: 3 thin slices bacon; 1 lb. sugar;  $\frac{1}{4}$  cup water; 2 lb. flour;  $\frac{1}{4}$  tsp. mustard;  $\frac{1}{2}$  cup vinegar. Cut bacon in small pieces and fry until crisp. Add these to cooked greens. Add other ingredients to bacon fat and cook until thickened. If liked sliced raw onion may be added to greens. This amount is enough for one quart of cooked greens.
5. Greens may be cooked in boiling milk. They absorb a large amount of milk and supply a desirable means of getting more milk in the family's diet. Use about 1 cup of milk to 1 pound of spinach; cut in one-inch pieces. Boil 10 minutes.
6. Leaves: Mixture of vegetables and cereals, such as bread crumbs or cooked rice held together with egg. 2 cups chopped greens (spinach etc.);  $\frac{3}{4}$  cup cooked diced carrots; 2 cups cooked rice; 2 or 3 eggs slightly beaten. Mix and put in buttered loaf pan. Bake in moderate oven.

**Creamed Chard:** Strip the green from the ribs; boil the green alone. See number 6. Cream. The ribs are cut in three inch pieces; cover with boiling water and boil until tender; drain, salt and butter. Pile in center of shallow dish and pour the creamed green around. Garnish with 1 hard boiled egg chopped fine.

**Savory Spinach:** This is a fine way to use the remains of a ham bone, calf's or lamb's liver, or roast lamb. Allow about 1 cup of chopped, cooked meat to  $1\frac{1}{4}$  cups chopped spinach and 2 cups boiled rice. Mix these ingredients and season with 1 teaspoon salt,  $\frac{1}{8}$  teaspoon pepper and 2 tablespoons grated onion. Turn mixture into a casserole and pour over it enough milk so that milk will come to top.

**Parsnip Chowder:**  $\frac{1}{4}$  pound fat salt pork; 1 onion; 2 cupfuls raw, diced potatoes; 2 cupfuls raw, diced parsnips; 1 quart scalded milk;  $2\frac{1}{2}$  teaspoonfuls salt;  $\frac{1}{4}$  teaspoonful celery salt;  $\frac{1}{4}$  teaspoonful paprika;  $\frac{1}{2}$  teaspoonful pepper; 3 cupfuls boiling water; 3 tablespoonsful butter or fat. Dice the salt pork and place in the bottom of a chowder kettle. Add the onion, thinly sliced, and saute both to a golden brown. Then add the diced potatoes and parsnips, the seasonings, and boiling water. Cover and simmer thirty minutes, or until the potatoes and parsnips are tender. Then add the scalding milk and bring all to the heating point. Add the fat and serve with toasted crackers. Serves six to eight.

**Carrots Baked in Milk:** Wash and scrape the carrots. Cut them in pieces and put them into a baking dish. Add salt and a little butter. Cover with milk. Bake until soft. ( $\frac{1}{2}$  to  $\frac{3}{4}$  hours depending on carrots.)

**Norwegian Milk Soup:** 1 lb. fresh shelled green peas; 2 or 3 medium sized carrots, diced;  $1\frac{1}{2}$  qts. milk; 1 egg beaten; chopped parsley and minced small onion; salt to taste. Cook the peas and carrots in just enough water to cover. Bring milk to a boil and add to the peas and carrots and the juice in which they have been cooking. Take off the stove and while stirring add the beaten egg, and season to taste. Serve with a sprinkling of very finely chopped parsley in soup plate.

**Vegetable Meat Loaf:** To one pound of meat (ground beef) add  $\frac{3}{4}$  cup strained spinach,  $\frac{3}{4}$  cup diced or ground carrots, small onion minced and  $\frac{1}{4}$  cup tomatoes. Mix well and add one egg to keep the loaf together. Bake as an ordinary meat loaf. (Use liquid from spinach in soup, sauce or gravy).

**Baked Potato Surprise:** 2 large potatoes; 2 tablespoons butter; 1 pint canned spinach;  $\frac{1}{2}$  teaspoon salt;  $\frac{1}{2}$  teaspoon pepper; 3 strips bacon. Scrub potatoes and bake for one hour in hot oven (500°F.). When done cut in half lengthwise, and scoop out soft part. Mash and add remaining butter, seasoning and spinach. (Save spinach juice for soup or gravy. Refill potato shells and top each with half strip of bacon. Place in hot oven to brown. Will serve six.

For other recipes see:

Extension Circular 250 Winter Vegetable Cookery.  
Extension Circular 274 Regulating and Coordinating Health Factors (Salads)

**References:**— Extension Circular—288 Good Food Habits For The Family.  
Extension Circular—275 Food Needs For Health.  
Feeding the Family—Rose (New Edition).

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