NASH kNOWledge

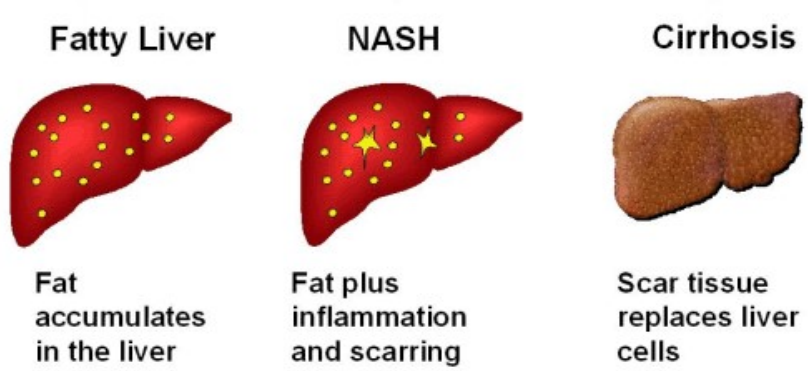
YOUR CHILD AND LIVER HEALTH

WHAT YOU SHOULD KNOW

Fatty Liver is the most common cause of chronic liver disease in children aged two to 19. It is estimated that 10% of all children and nearly 40% of obese children have a fatty liver. While obesity and diabetes are primary risk factors for fatty liver disease, children with neither can also be affected.

The effect on children is part of a larger issue. The National Institutes of Health estimates that 100 million Americans of all ages have Non-Alcoholic Fatty Liver Disease (NAFLD) and up to 25 million have Non-Alcoholic Steatohepatitis (NASH). This issue is discussed in more detail throughout our website (www.nash-now.org).

Everyone has some fat in their liver. A fatty liver diagnosis means the amount of fat (usually in excess of 5-10%) is unhealthy. This condition is called NAFLD. There are two main factors responsible for fatty liver in children - - poor diet choices (such as food and drinks with high sugar content along with and processed food) and lack of physical activity. Fatty liver often causes no problems, but it can lead to more serious liver damage, as shown below:



Source: www.gastroconsa.com

NAFLD and NASH, together, are often called the silent epidemic. Here's why:

- **Usually there are no symptoms**
- **Liver health is not typically mentioned in health discussions**
- **Most people have never heard of either condition**

There are presently no medications for fatty liver. However, the liver is a forgiving organ and damage from NAFLD and the early stages of NASH can be reversed through attention to healthy eating and physical activity.

LACK OF PHYSICAL ACTIVITY

Most of this discussion will center on nutrition, but the need for physical activity cannot be ignored. Many, if not most, children today spend too much time in front of electronic devices.

It is important for a child to be physically active. This can take any number of forms ranging from participating in sports, walking, swimming or simply running around the back yard.

The goal is 60 minutes of daily activity. Life sometimes gets in the way of achieving this goal. It is okay if your child misses a day or two here and there, but don't let it become a habit.

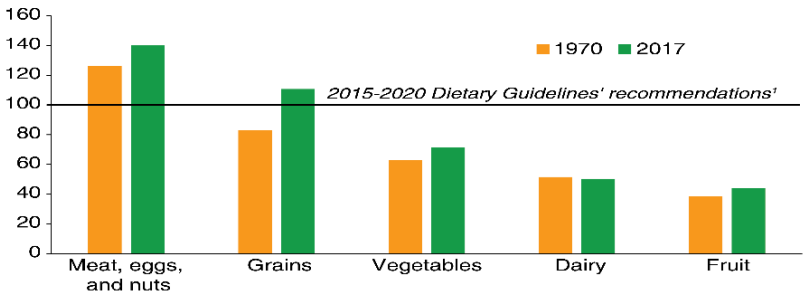
THE PROBLEM WITH CHILDREN'S DIET

According to the Journal of the American College of Nutrition, only 25% of children meet the daily recommendations for fruit and vegetable consumption. Figure 1 compares actual and recommended consumption, for 1970 and 2017, of various food classifications. The chart, from the USDA, shows the situation for Americans of all ages, not just children.

Figure 1

Estimated average U.S. consumption compared to recommendations, 1970 and 2017

Percent of *2015-2020 Dietary Guidelines'* recommendations

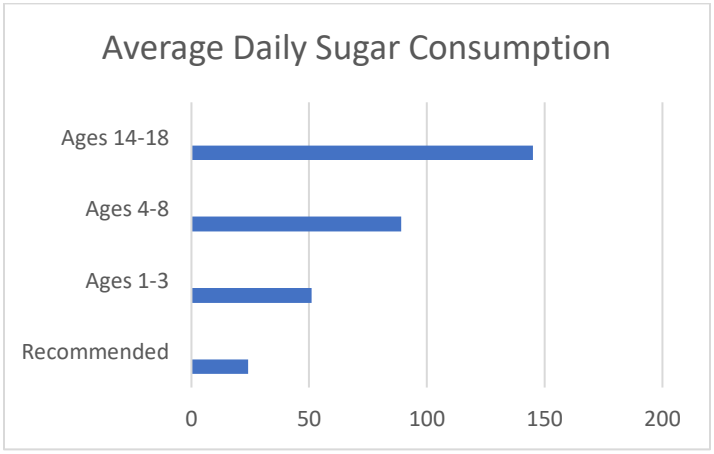


¹Based on a 2,000-calorie-per-day diet.
Loss-adjusted food availability data are proxies for consumption. Rice availability data were discontinued and thus are not included in the grains group.
Source: USDA, Economic Research Service, Loss-Adjusted Food Availability Data and *2015-2020 Dietary Guidelines*.

A properly balanced diet is an important element of good health. See the Appendix for children's recommended daily nutrition requirements.

Limiting sugar is especially critical for good liver health. According to the National Cancer Institute (NCI), children of all ages, on average, consume far more sugar than recommended (6 teaspoons, or 24 grams, per day), and it gets worse as they get older.[1] Figure 2 is derived from the NCI data and reflects the magnitude of the issue.

Figure 2



It is important to distinguish added sugar from naturally occurring sugar. Fruits (not fruit juices) and vegetables are the main sources of natural sugar. While in many ways "sugar is sugar", added sugar is not as healthy as natural sugar. Added sugar contains empty calories, few nutrients, is more concentrated and enters the bloodstream more quickly. Natural sugar contains fiber and other nutrients. Fiber, which is missing in added sugar, slows the absorption of sugar into the bloodstream. The principal sources of added sugars are sweetened beverages (39%) and snacks and sweets (31%).[2]

It is inevitable that children will have days when they consume too much sugar. Whether it be a piece of birthday cake with a scoop of ice cream, a chocolate bar or a stop at the ice cream stand after a game, there will be situations that may be unavoidable. It is not practical to expect a child to pass up being part of these occasions.

[1] https://www.familyeducation.com/life/sugar/are-we-too-sweet-our-kids-addiction-sugar
[2] Dietary Guidelines for Americans 2015-2020 published by the U.S. Department of Agriculture, 2015

An infrequent treat doesn't hurt. It is important, though, to be consistently mindful of your child's daily food and drink choices and to educate yourself on what is truly harmful. There is no shortage of misinformation from a variety of sources. This often leads parents to believe they are making healthier choices for their child and family than they truly are. Packaging and advertising aimed at children also makes it difficult to balance health with desires.

High-fructose corn syrup (HFCS), and sugar in general, is the main enemy of our children's liver health. According to the USDA, HFCS constitutes more than 40% of the caloric sweeteners used in our foods and beverages as compared to less than 1% in 1970. The public is becoming increasingly aware of the health risks associated with HFCS, but we still need to reduce our consumption.

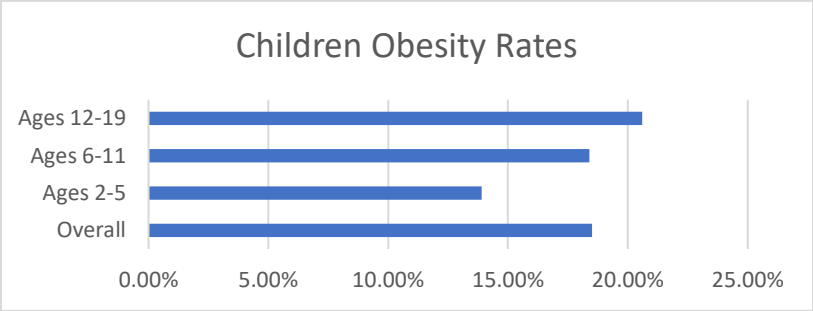
For a more detailed nutrition discussion see our Nutrition page (under Education) on www.nash-now.org.

HOW DID THIS HAPPEN: THE DRAMATIC EFFECT ON OUR HEALTH

Starting in the late 1970s, the government and others led a campaign to reduce the amount of fat in our foods. Fat was the villain in our diet. Fat developed a bad reputation and was often replaced by added sweeteners in many products to improve taste. This made food taste good but has wreaked havoc with the nation's eating habits, resulting in an increase in obesity, diabetes and liver disease.

According to the Center for Disease Control and Prevention, during the past 40 years obesity rates of children ages 6 to 11 has nearly tripled and the obesity rates of adolescents has more than tripled. Figure 3 shows recent obesity rates by age group.

Figure 3



Source: https://www.cdc.gov/obesity/data/childhood.html

The problem worsened when many food companies started to better understand, and take advantage of, the addictive nature of sugary foods and drinks. Concurrent with food companies being acquired by tobacco companies during the 1980s, marketing tactics that

tobacco companies used decades ago to drive nicotine addiction were suddenly being implemented more prominently to drive sugar addiction in children.

Research indicates that advertising influences children's food preferences, what they ask their parents to purchase for them and their diet. Several European countries regulate children television advertising. In the United States, arguably to avoid government regulation, large food and drink companies formed the Children's Food and Beverage Advertising Initiative in 2007. The intent of the group was to reduce children-targeted advertising of unhealthy food and drinks.

There are mixed views regarding how successful this Initiative has been. In 2018, the University of Connecticut's Rudd Center for Food Policy and Obesity released "Trends in Television Food Advertising to Young People: 2017 Update".[3] Figure 4 shows the change from 2007 to 2017 in ads viewed per year for each child.

Figure 4

	CHILDREN 2-11		CHILDREN 12-17		ADULTS 18-49	
	2007	2017	2007	2017	2007	2017
TOTAL FOOD ADS	3036	2298	2883	2037	3221	3763
ADS VIEWED FOR SELECT FOOD CATEGORIES:						
CEREALS	772	329	443	220	378	306
CANDY	266	383	311	373	287	658
PREPARED MEALS	420	266	418	197	554	336
SWEET SNACKS	432	142	310	152	301	296
YOGURT	178	76	129	63	148	128
CARBONATED BEVERAGES	57	102	124	130	129	236
JUICES, SPORTS DRINKS, FRUIT BEVERAGES	188	167	235	135	273	236
FRUITS AND VEGETABLES	22	45	22	34	43	62
ADS VIEWED BY RESTAURANT CATEGORY						
RESTAURANTS ADS						
FAST FOOD	973	962	1437	1067	1628	2031
OTHER	437	405	492	345	670	668

Figure 4 reflects a 24% decline in food ad views for children 2-11 and a 29% decrease in food ad views for children ages 12-17. At first glance this looks like an impressive accomplishment, but it is somewhat deceiving as much of the trend is due to a decline in television viewing.

Television viewing has declined from 2013 to 2017 by about 30% in children ages 2-11 and nearly 35% in children 12-17.[3] Presumably, the decline is a result of the increased popularity and use of video games on laptops and other electronic devices.

[3] http://uconnruddcenter.org/files/Pdfs/TVAdTrends2018_Final.pdf

There is still a lot of room for improvement when it comes to television advertising aimed at children, given the potential effect that such advertising has on children's eating preferences.

WHAT SHOULD I DO?

Understanding what you and your children are consuming daily is critical to good liver health and overall health. This is easier said than done since the food industry changes over time. Also, our busy lifestyle often results in eating convenient and cheaper food, which are usually not the healthy choice. Healthy eating is a family issue, not one confined to children. Children will model the eating choices of the rest of the family.

Nutrition Facts

Serving Size 1/2 cup (about 82g)
Servings Per Container 8

Amount Per Serving

Calories 200 Calories from Fat 130

	% Daily Value*
Total Fat 14g	22%
Saturated Fat 9g	45%
Trans Fat 0g	
Cholesterol 55mg	18%
Sodium 40mg	2%
Total Carbohydrate 17g	6%
Dietary Fiber 1g	4%
Sugars 14g	
Protein 3g	

Vitamin A 10% • Vitamin C 0%
Calcium 10% • Iron 6%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300 mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

It is not always easy to make informed decisions about food and drink choices. The combination of misleading advertising and incorrect information on the internet makes it confusing. The bottom line, however, is that we need to start viewing food as nutrition and that begins by understanding healthy food options and daily nutrition recommendations. This includes reading nutrition labels and understanding what is going into our children's bodies. In addition to nutritional labels, nutrition information can usually be found on a company's website or internet websites such as www.fatsecret.com

Encouraging more physical activity is also important. Think about limiting "screen time" and make time for exercise or active play.

Finally, consult your pediatrician or doctor if you feel your child is at risk. They know your child's history and are best positioned to monitor your child's health.

HEALTHY LIVER TIPS

TIP	WHY IT'S IMPORTANT
More exercise; less screen time	60 minutes of active play or exercise per day is important for children as it helps keep them healthy and contributes to maintaining a healthy weight.
Read nutrition labels	A parent may be surprised by what they read. Many foods, especially those marketed to children, that appear to be healthy may not be. It is important to be aware of what your child is consuming. Pay particular attention to the presence of added sugars.

TIP	WHY IT'S IMPORTANT
Limit consumption of high-fructose corn syrup (HFCS)	**HFCS is a major source of sugar consumption in children and is present in more foods and drinks than you might think. Too much sugar is unhealthy.** **A single serving of soda pop, candy, sweetened yogurt or frozen snacks and meals often contain more than the daily recommendation for sugar.**
Drink water, not energy drinks, soda pop or fruit juices	**Beverages are the principal source of sugar consumption for many children. 12 ounces of soda pop contain 1.5 times the daily sugar recommendation. Diet versions avoid sugar but contain other additives that may be harmful.** **Fruit juices are high in sugar and, while having some health benefits, should be consumed in small portions (less than 12 ounces). Water is always the best option.**
Eat fruit, not candy or other sweets	**A single candy bar typically contains 1.5 times the daily recommendation for sugar. Cakes, ice cream and cookies also have high sugar content.** **A cup of berries contains only 7 grams of sugar, less than 1/3 of the recommended amount.**
Limit fast foods	**Fast food generally isn't high in sugar but contains high levels of sodium. A Big Mac with fries contains over 1500 grams of sodium and almost 1000 calories.** **A chunky peanut butter sandwich on whole wheat bread is a better choice; including jelly, adds sugar.**
Eat more fiber from good sources	**Including fiber in your diet is important. Fiber slows the rate of sugar absorption into the blood stream, removes bacteria from the colon and contributes to regular bowel movements.** **Beans, whole grain products, brown rice and broccoli are good sources of fiber. Fiber-added foods like frozen pizza and microwaveable dinners are less healthy as added fiber contains fewer vitamins, nutrients and antioxidants.**
Eat healthy snacks	**Avoid sweets and junk food.** **Snack on fruits, vegetables and nuts.**

TIP	WHY IT'S IMPORTANT
Eat a healthy breakfast	**Sweetened cereal, doughnuts and breakfast bars are not good breakfast choices.** **Healthy breakfasts include eggs (no sugar and low in sodium), Cheerios (1 gram of sugar vs. 15 grams for Frosted Flakes) and oatmeal.**
Eat whole foods; limit processed food	**Processed foods (which include canned foods, processed meats, fried foods and desserts) are high in sodium, may have excessive HFCS and contain empty calories.** **Whole foods are rich in plant chemicals that have protection and disease prevention properties while also containing more minerals and vitamins than processed foods. Fruits, vegetables, fish, poultry and lean beef are healthy options.**

APPENDIX: DAILY NUTRITION REQUIREMENTS FOR CHILDREN

This appendix is largely derived from the USDA[4] but is supplemented from other sources. Thanks to our friends at Case Specific Nutrition for reviewing this table.

Daily Nutrition Requirements (all amount in grams)

	Age in Years					
Category	**1-3**	**4-8**	**9-13**	**14-18**		
Calories	**800-1200**	**1200-1400**	**1600-2000(B) 1400-2000(G)**	**2000-2200(B) 1800 (G)**	**Healthy Sources**	**Unhealthy Sources**
Sugar	**24**	**24**	**24**	**24**	**Milk, Fruit, Vegetables, Unsweetened Greek Yogurt**	**High Fructose Corn Syrup, Candy, Ice Cream, Juice, Soda**
Fat	**33**	**39**	**62**	**62 (B) 55 (G)**	**Avocados, Nuts, Fish, Olive Oil, lean red meat, skinless poultry**	**Snack foods, butter**
Saturated Fat	**<12-16**	**<16-18**	**<20-24 (B) <18-22 (G)**	**<24-27 (B) <22 (G)**		
Sodium	**1000-1500**	**1200-1900**	**1500-2200**	**1500-2300**	**Dairy products, beets, celery**	**Fast food, canned soup, processed foods, salt**
Carbs	**130**	**130**	**130**	**130**	**Fruits, Beans, Peas, Whole Wheat Products**	**Candy, Soda, Pastries, Sugary Cereal, White Bread**
Fiber	**14**	**20 (B) 17 (G)**	**25 (B) 22 (G)**	**31(B) 25 (G)**	**Beans, whole grains, brown rice, popcorn**	**Fiber added processed foods**
Protein	**13**	**19**	**34**	**52 (B) 46 (G)**	**Canned tuna, eggs, natural peanut butter, edamame, black beans**	**Beef jerky, sausage, fast food**

[4] Dietary Guidelines for Americans 2015-2020 published by the U.S. Department of Agriculture, 2015