NASM
NATIONAL ACADEMY OF SPORTS MEDICINE

THE NASM GUIDE TO

DECODING NUTRITION LABELS

WHAT ARE FOOD LABELS REALLY TELLING YOU ABOUT THE FOODS YOU BUY?

Contents

Welcome!

We are excited that you decided to dive into the topic of food labels with us here at the National Academy of Sports Medicine. We are honored to be a part of your educational journey and to help you decode and understand food labels which will allow you to develop lifelong tools in making the optimal decisions about nutrition for yourself.

On their surface, food labels might seem simple. However, when digging deeper into the history of when, why, and how they came about, and how they have evolved into their current form, you learn a lot about how our food system actually works. Most recently, the FDA changed food labels to their current form in 2016, which shifted the focus of food labels toward serving sizes and total calories. While this was a great step in helping educate consumers, there is still a lot of information buried in food labels that most consumers are not aware of.

This guide is focused on helping you understand the current FDA approved food labels in addition to providing all the hidden details and information you miss if you don't know exactly how the information on food labels comes into existence. We hope that after reviewing this guide, you feel more comfortable reviewing food labels and making food choices based on the information in those labels.

About NASM

The National Academy of Sports Medicine is the leader in educating and credentialing fitness, wellness, and performance professionals across the globe. We provide valid, up-to-date content on topics that improve the health and well-being of those they serve. We pride ourselves on creating practical content you can apply right away. Learn more about us at www.nasm.org, your favorite social media platform, or wherever you listen to podcasts.

Getting the Most from This Guide

This NASM Guide to Decoding Nutrition Labels will walk you through information explaining a little bit of the "why" behind the "how". We'll make sense of the information out there so you won't have to. We'll also give you insider information that you might not be able to find elsewhere. Then we'll give you some key takeaways and actionable steps to apply whenever you like.

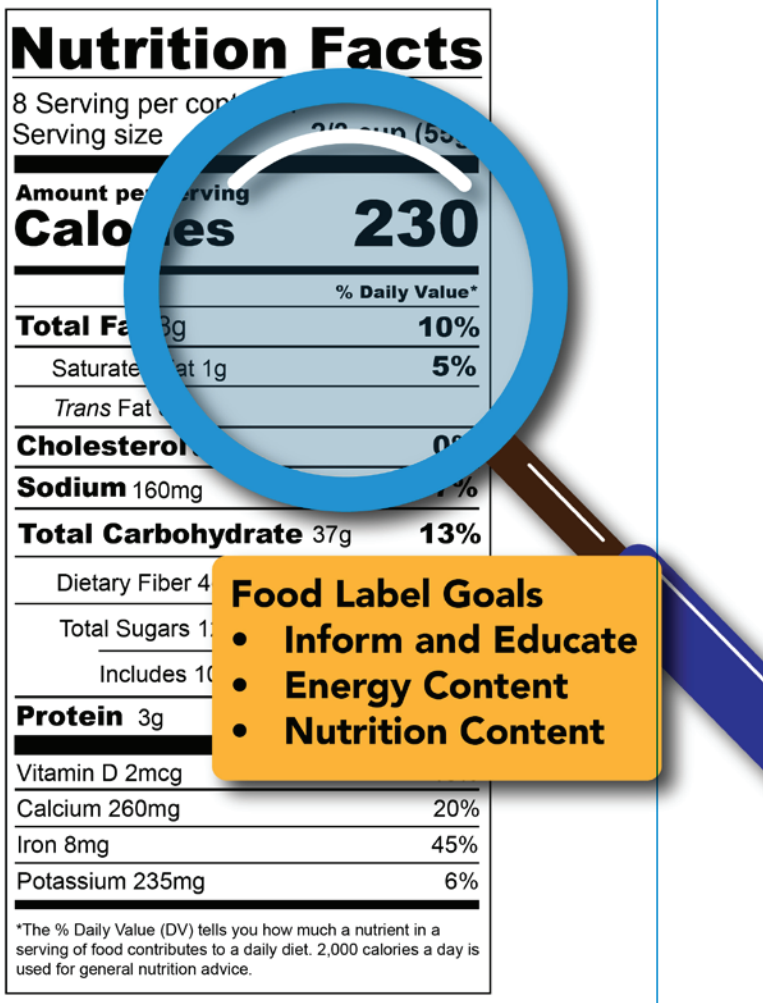
Come back and use the information as a reference any time. Be sure to use the key takeaways and application strategies in whatever way makes sense for you. Don't feel obligated to put everything into action right away. When you're ready for a deeper dive on the topic, check out our recommended resources.

Introduction

If we were to ask you when food labels were first required, what would your answer be? Would you guess the 1970s, or 1950s, or maybe even the 1930s? Food labels were actually required as far back as 1906 when congress passed the Pure Food and Drug Act of 1906. This was considered one of the first consumer protection laws in the United States and was one of the major steps in the creation of the FDA.

While there have been many versions of the food labels over the last century, one of the biggest changes occurred in the 1990s when the Nutrition Labeling and Education Act of 1990 was passed. This act helped the FDA create the modern nutrition label, which contains information on serving sizes, specific nutrients, and helped create Recommended Daily Intake (RDI) values for macronutrients and micronutrients (Institute of Medicine (US) Committee on Examination of Front-of-Package Nutrition Rating Systems and Symbols, 2010).

The goal of food labels is to provide information and educate you, the consumer, on the energy content and nutrition content of the food you are consuming, especially food produced or processed by manufacturers. As research, society, and environments change, the relative importance of certain aspects of our food change, which has resulted in our food labels changing over time, ultimately leading to additional education required for you, the consumer.



The Anatomy Of A Food Label

The food label has changed a lot since 1906 and most recently was changed into its current form by the FDA in 2016 (Center for Food Safety & Nutrition, 2023a). Each iteration of the food labels has contained different information, focused on different core aspects of food, and displayed food information in a different way. The most current version of the food label focuses on serving sizes and servings per package, calories, and added sugars more than previous food labels have.

If you look at the current food label you will find the following major sections:

- Servings and serving sizes
- Calories
- Fats
- Cholesterol
- Sodium
- Total Carbohydrate
- Protein
- Micronutrients
- Daily Value

Nutrition Facts

8 servings per container

Serving size **2/3 cup (55g)**

Amount per serving

Calories **230**

	% Daily Value*
Total Fat 8g	**10%**
Saturated Fat 1g	**5%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 160mg	**7%**
Total Carbohydrate 37g	**13%**
Dietary Fiber 4g	**14%**
Total Sugars 12g	
Includes 10g Added Sugars	**20%**
Protein 3g	
Vitamin D 2mcg	10%
Calcium 260mg	20%
Iron 8mg	45%
Potassium 240mg	6%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Each of these sections contains important information about the food you purchase and consume. However, although there is a lot of information present in these labels, there are important details and caveats about the information in food labels that you should know so you can make the best decisions for yourself. Let us walk through each section together and discuss and highlight the hidden information you might not be aware of.

Servings and Serving Size

The first and topmost portion of the nutrition label tells you about the serving size and how many servings are present in a given package. This information is often overlooked in packaged foods because many individuals assume an entire package is a serving, especially when packages are smaller. However, most foods that are purchased come in packages that are more than one serving. In the example here, this food has a serving size of 2/3 of a cup, and the entire package contains 8 servings. This means that the entire package contains 5 1/3 cups of the food.

One of the more important but often overlooked pieces of information in this section is the serving size by weight, often labeled in grams in parenthesis after the volume based serving size. This is important because weighing by weight is often far more accurate than weighing by volume. Just ask any pastry chef; they almost always weigh their ingredients instead of measuring using volumes (measuring cups).

Servings and Serving Size

Nutrition Facts

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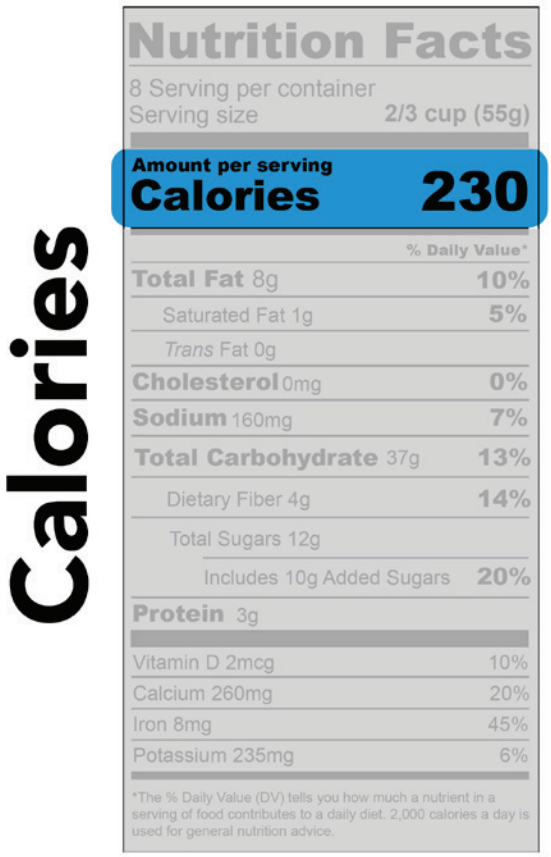
TRY THIS

The most accurate way to measure most foods is by weight, especially dry goods such as rice, pasta, oats, and cereal. This is because the way the food is packed into a measuring cup can substantially change the actual amount of food.

One experiment you can use is to use brown sugar and lightly scoop it out and measure out a cup, then pack it down very tightly and see how much more volume you can fit in there. Now measure brown sugar using weight. You will find it doesn't matter how you pack it, the weight measurement is always the weight!

Calories

The next section on the food label that you will encounter is the calories section. While this section seems straightforward, there are a lot of things to consider that the label will not tell you directly. The first thing to note is that the calories listed are per serving, not per package. So, in our example label there are 230 calories noted per serving, which means there are 1,227 calories in the entire package (230 x 5 ?). The second thing to note is that these are not actually calories, they are kilocalories, but we all call them calories. The third thing to note is that this section is always rounded. If the serving is less than 5 calories, they round down to 0. If the serving is less than 50 calories they round to the nearest 5 calories, and if the serving is more than 50 calories they round to the nearest 10 calories. Lastly, the calorie number is actually an estimate based on the amounts of energy-containing macronutrients (protein, carbohydrates, and fats) per serving.

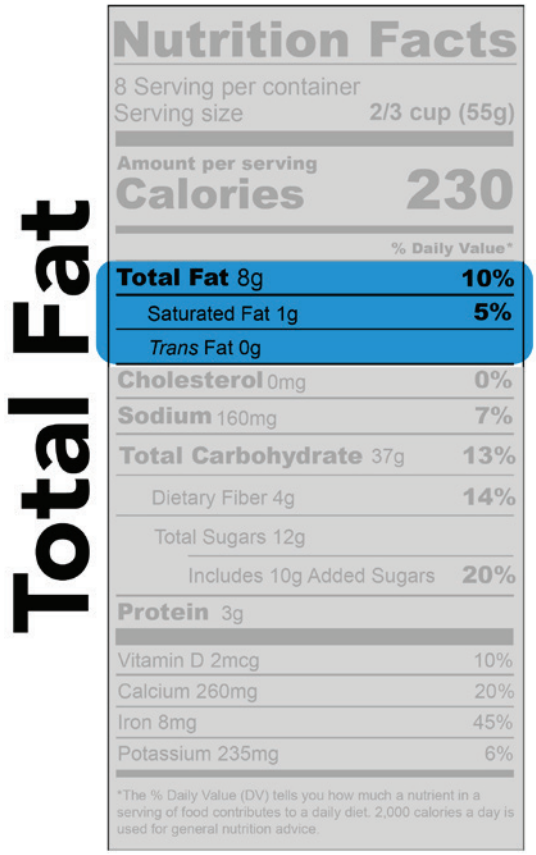


Fats

The fats section provides information on:

- Total Fat (in grams)
- Types of fats present
- Total percent of daily value for a diet consisting of 2,000 kcals per day

The FDA does not actually require food manufacturers to provide information on any types of fats besides saturated fats and trans fats, so there may or may not be information on poly- and mono-unsaturated fats on food labels. Additionally, there will not be any percentage of daily value for those fats either as the FDA does not have guidelines for those as well.



While unsaturated fats might not be listed, you can often infer how many there are by taking the total fat in grams and subtracting the saturated fat grams and trans fat grams. The remaining grams should be the total amount of unsaturated fats in grams.

Unsaturated Fat = Total Fat – (Saturated Fat + Trans Fat)

The daily value for total fat is 78 grams a day and the daily value for saturated fats is 20 grams per day for a 2,000-kcal diet. You will notice there is also no percent of daily value for trans fats because the FDA has labeled trans fats as not Generally Recognized as Safe and has aimed to eliminate trans fats from all commercially produced foods (Center for Food Safety & Nutrition, 2023b). However, manufacturers can report trans fat content as 0 if it contains <0.5 grams per serving. As such, it is possible that a package with 10 servings could contain up to 4.9 grams of trans fats and have a reported value of 0. Some foods might still contain trans fats, such as industrial pastries, some fried foods, and shortening or margarine. Look for the words "partially hydrogenated oils" in the ingredient list as a way to tell if the food includes trans fats.

DIGGING DEEPER

The FDA has guidelines around any substance that is added to food and its general safety profile. The FDA has criteria and standards that additives must meet to be determined as "Generally Recognized as Safe".

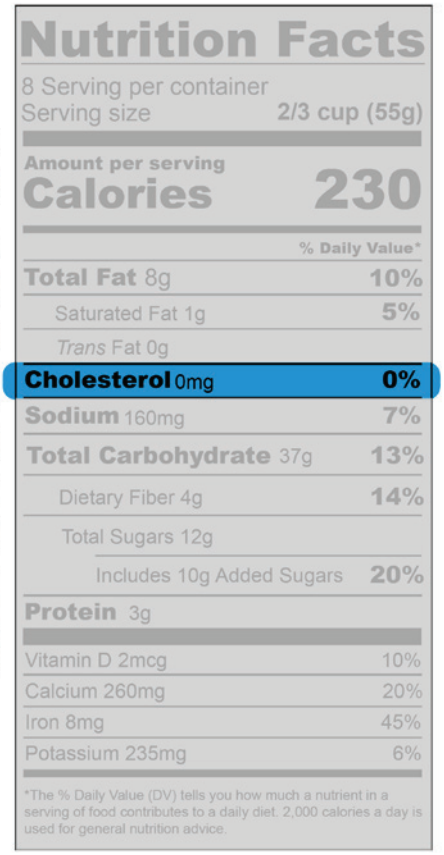
FDA GRAS Full Report and Standards Article

Other ingredients currently found on this list include Betel Nut, CBD, 1,3-DMAA, and even melatonin. This means these ingredients cannot be added to conventional food products.

Cholesterol

While cholesterol is often thought of as a type of fat, it actually is its own type of compound and its own class of nutrient. It's also found in certain foods and consumed in much smaller quantities compared to other fats. This is why it has its own line item on a food label. However, like the other fat nutrients, there is both the total amount per serving listed, as well as what percent of our daily value that amount represents. The FDA has set the daily intake for cholesterol at 300 mg for a 2,000 kcal per day diet. To put this into perspective, that is ~2 standard sized eggs per day. Similar to other nutrients, a 0 is not always 0. If there is <2 mg of cholesterol per serving, the label will read 0. For example, some low-fat dairy products might have trace amounts of cholesterol that are below the reported limited per serving, but when consumed in large quantities might provide some cholesterol.

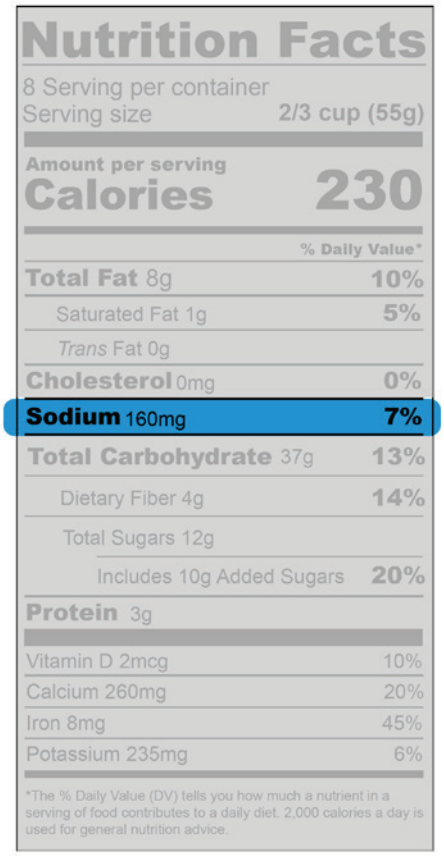
Cholesterol



Sodium

Sodium is the only vitamin or mineral listed in the main section of the food label. This is primarily because sodium is consumed in the largest quantity of all vitamins and minerals. It is also partially due to the importance of sodium in some health conditions such as hypertension (~50% of the adult population) and established cardiovascular disease (6 to 9% of the adult population (Juraschek et al., 2021). The FDA guidelines for sodium intake is 2,300 mg per day for adults consuming a 2,000-kcal diet.

Sodium



Carbohydrates

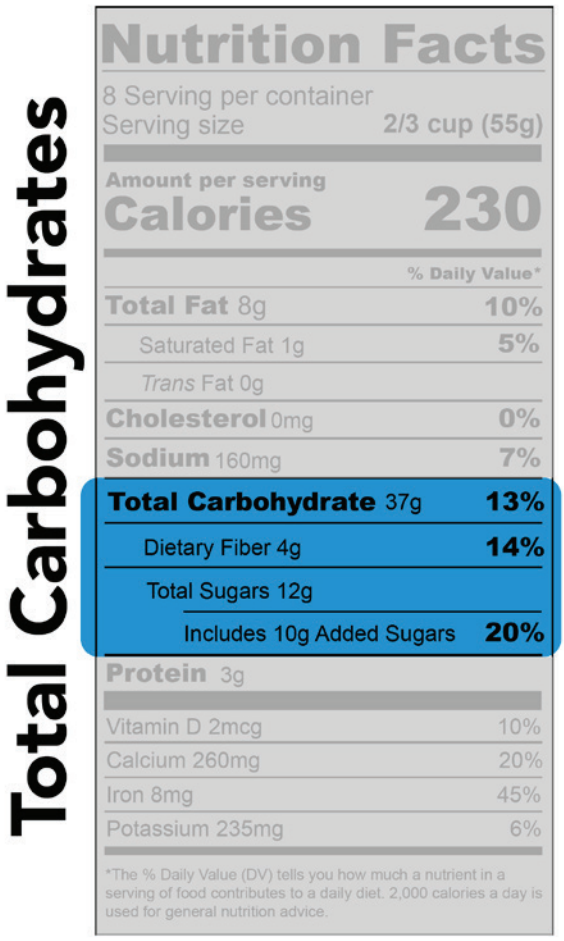
The carbohydrate section on nutrition labels contains the largest amount of information and also can be the most confusing section for consumers. This section breaks carbohydrates down into multiple categories:

- Total Carbohydrates
- Dietary Fiber
- Total Sugars
- Added Sugars

Each of these categories requires a deeper dive to understand what they mean and what the implications are for the food you consume.

Total Carbohydrate

Total carbohydrate represents the total amount of carbohydrates that the manufacturer includes in the calorie count of the food. This may or may not include the calories from dietary fiber, which we will discuss in detail below. The FDA has set the total carbohydrate intake at 275 grams per day for adults following a 2,000-kcal diet, which decreased from 300 grams per day prior to the recent label change in 2016. This reflects ~55% of total daily calories coming from dietary carbohydrates.



Dietary Fiber

Dietary fiber is reported as a total value, however it rarely provides information about the subtypes of fiber: soluble and insoluble fiber. This is important because manufacturers can, at their discretion, subtract insoluble fiber calories from the total calories. This often explains why total calorie amounts do not often match up with when calculating calories from the macronutrients.

In the example used here, there are 4 grams of dietary fiber shown, but it is not clear whether these are or are not included in the total carbohydrate line. Perhaps there are really 33 grams of digestible carbohydrates or 41 grams of digestible carbohydrates. While this might seem like a small error (8 grams), if you were to consume the whole 5 servings of the box, that would be ~42 to 43 grams of carbohydrates, which is an extra 100 calories.

The FDA has updated their fiber recommendations from the previous 2016 labels and now recommends 28 grams of fiber per day for adults consuming a 2,000-kcal diet. This means that adults should consume ~14 grams of fiber per 1,000 kcals consumed.

Total Sugars and Added Sugars

For many of you, you will feel that the total sugars line is often one of the most important pieces on the food label. Because of that, it is important to understand exactly how to interpret it. Total sugars represent the total amount of sugar that is present in the food, including both sugars naturally found in the food and sugars that have been added during manufacturing (*i.e.*, added sugars). Most people will think this simply means sugar such as table sugar, but it actually means the total amount of simple carbohydrates in the food. This could be fruit sugar (fructose), dairy sugar (lactose), grain sugar (maltose), glucose, and even table sugar (sucrose). Most carbohydrate foods will contain some of these simple sugars, even things like apples, oranges, milk, and even some starches do contain small amounts of simple sugars.

Determining the amount of sugars found in the food versus the ones that are added to the food during manufacturing is a relatively simple process. The added sugars are spelled out very clearly in the line labeled "added sugars". In the example we are using, there are 10 grams of added sugars. The sugars that are found in the food "naturally" are the total sugars minus the added sugars, so in this case it is 2 grams (12 - 10 = 2). This means that this food has a lot of added sugars relative to the naturally occurring and naturally found sugars.

Protein

The line item for protein is maybe the simplest item on the nutrition label. This line tells you the total number of grams of protein that can be found per serving. It does not specify a daily value as this number depends more on an individual's body weight than as a percentage of calories. Additionally, this line item does not provide any information about whether the protein source is a complete protein source or not (meaning it is missing one or more essential amino acids).

Protein

Nutrition Facts

8 Serving per container
Serving size 2/3 cup (55g)

Amount per serving
Calories 230

	% Daily Value*
Total Fat 8g	**10%**
Saturated Fat 1g	**5%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 160mg	**7%**
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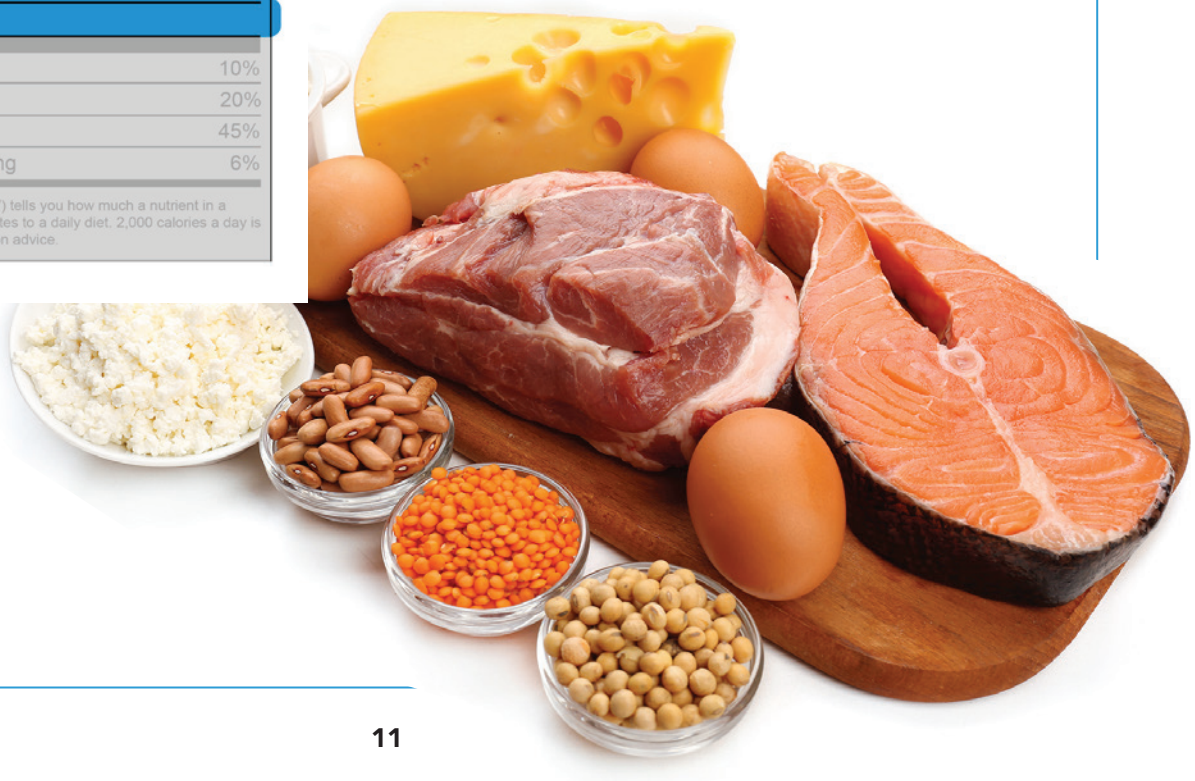
DIGGING DEEPER:

While food labels tell you only the total amount of protein present in a food, they do not provide information about the type of protein. Protein can be divided into two types of proteins: complete and incomplete proteins. The distinction between the two is based on whether or not they contain all of the essential amino acids. Complete proteins contain all nine of the essential amino acids while incomplete proteins are missing one or more of the nine essential amino acids. Generally speaking, animal-based foods such as animal meat, dairy, eggs, and cheese are complete proteins while plant-based proteins are incomplete proteins.

The essential amino acids are the amino acids that your body cannot produce on its own or cannot produce in sufficient quantities to meet your body's daily needs for those amino acids and they must be consumed through the food we eat.

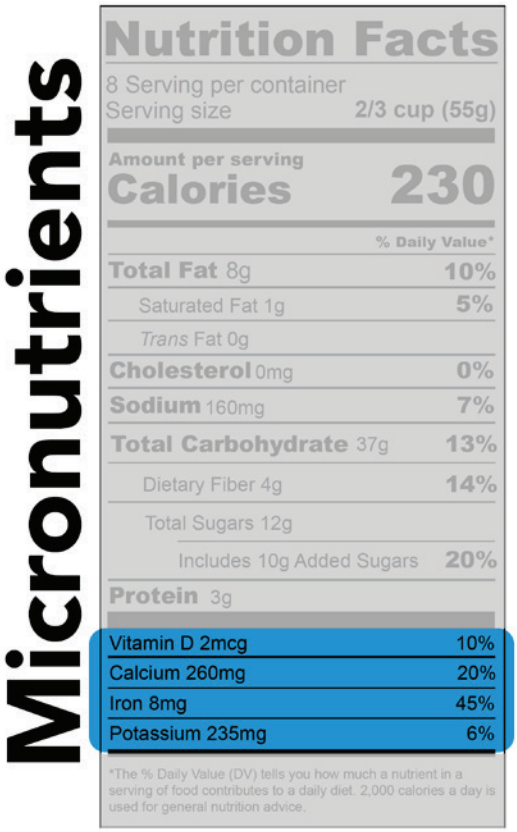


Micronutrients

The last major section of the nutrition label contains information on non-sodium and non-cholesterol micronutrients, specifically vitamins and minerals. Food manufacturers are required to tell you about any vitamins or minerals that are added to the food when manufacturers make health statements about the food (*e.g.* lowers blood pressure) or when they make a statement about the amount of a given micronutrient in the food (*e.g.* high in iron). The percentage that the serving represents of the daily value of any nutrient must also be noted.

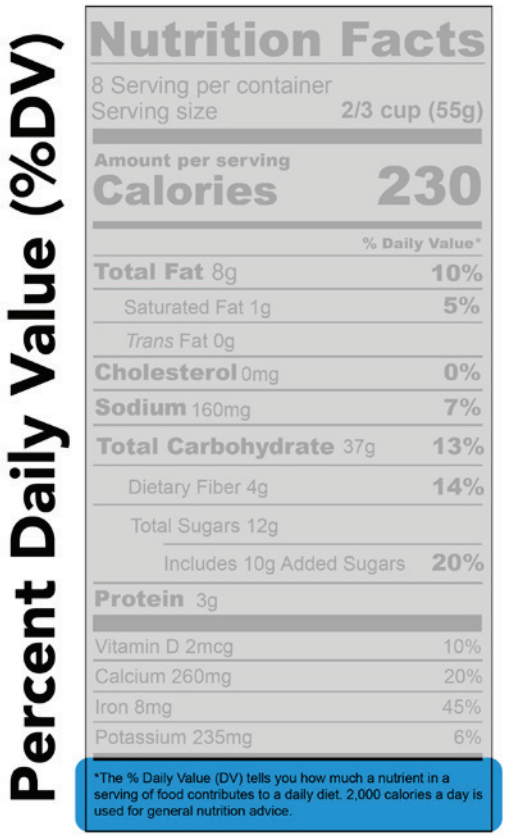
The daily values for each major micronutrient can be found on the FDA's website:

Daily Value on the New Nutrition and Supplement Facts Labels.



The Footnote

At the very bottom of the nutrition label you will notice a short footnote that lets you know that all of the daily values are based on a 2,000 kcal per day diet and that the information should be used as general nutrition advice. In reality, most people do not consume a 2,000 kcal a day diet and they should adjust their intake and percentages based on their individual needs. The percent of daily value should give you a rough idea of how nutrient dense a food is for that given nutrient but should not necessarily be used for exact amounts for each individual person.



Conclusion

Food labels became a part of American culture in the early 1900s and continue to be a critical part of our food supply. These food labels are designed and intended to provide transparency about the foods we consume and to provide information and education to the consumer. The most recent version of the food label was updated by the FDA in 2016 and focuses on informing the consumer about serving sizes, total energy intake, macronutrient intake, and a few key nutrients such as cholesterol, sodium, fiber, and added sugars.

When you are looking at food labels, there are a few important things to remember. First, pay close attention to the serving sizes as there are often multiple servings in a singular package. Second, the calories presented on the package might not be 100% accurate because manufacturers can make choices on how to report certain nutrients like fiber and whether or not they contribute to overall caloric intake. Third, manufacturers can round numbers on individual nutrition and total calories. Lastly, the daily percentages noted on food labels are based on a 2,000 kcal per day diet, which relatively few people need exactly 2,000 kcals per day, so you will need to adjust your daily percentages based on your intake.

Food labels should be viewed as educational tools to help you make food decisions that best fit your goals. They should not, however, be viewed as 100% true and accurate all the time and as the basis for all your nutrition decisions.

What You Can Do Now

Now that you have gone through a deep dive into how food labels work, what the components of them are, and have learned some of the contextual information you should know that is not provided by the labels, you can begin taking action when making food choices.

1. Review the food labels of foods you consume and begin to consume the food based on the serving sizes recommended by the package. This will help you better understand servings and portion sizes and how to accurately estimate calorie intake.
2. Determine your own calorie needs based on your demographics and activity levels using the NASM Calorie Calculator. Then, create your own daily values and percentages based on those numbers.
3. Review food labels and determine whether the total calories are accurate based on the rounding criteria and record the actual amount of calories.
4. Find the true total calorie count in a food by determining if the fiber nutrients are included or not included in the total calories.
5. Determine the amount of added sugar in food you consume and work to keep those to a moderate level in your daily diet.

Online Resources

Want to learn more about nutrition? Here are a few places to find reliable information and insight about nutrition and healthy eating behaviors.

- ➔ NASM Certified Nutrition Coach Certification (NASM-CNC)
- ➔ NASM Blog
- ➔ NASM YouTube Channel

References

Center for Food Safety & Nutrition. (2023a, April 13). *Changes to the Nutrition Facts Label*. U.S. Food and Drug Administration; FDA. https://www.fda.gov/food/food-labeling-nutrition/changes-nutrition-facts-label

Center for Food Safety & Nutrition. (2023b, August 2). *Final Determination Regarding Partially Hydrogenated Oils (Removing Trans Fat)*. U.S. Food and Drug Administration; FDA. https://www.fda.gov/food/food-additives-petitions/final-determination-regarding-partially-hydrogenated-oils-removing-trans-fat

Institute of Medicine (US) Committee on Examination of Front-of-Package Nutrition Rating Systems and Symbols (2010). History of Nutrition Labeling. In *Front-of-Package Nutrition Rating Systems and Symbols: Phase I Report*. National Academies Press (US).

Juraschek, S. P., Kovell, L. C., Appel, L. J., Miller, E. R., Sacks, F. M., Chang, A. R., Christenson, R. H., Rebuck, H., & Mukamal, K. J. (2021). Effects of Diet and Sodium Reduction on Cardiac Injury, Strain, and Inflammation: The DASH-Sodium Trial. *Journal of the American College of Cardiology, 77*(21). https://www.sciencedirect.com/science/article/pii/S0735109721011104?via%3Dihub

THANKS FOR READING!

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