PART 4

FROM FOOD GUIDES TO NUTRITION EDUCATION
CHAPTER 14

DIETARY RECOMMENDATIONS, FOOD GUIDES, AND FOOD LABELS

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Outline

• Dietary guidelines, including food-based dietary guidelines
• Food guides
• Tables of recommended intake of nutrients, such as Recommended Dietary Allowances (RDA)
• Food labels

Objectives

At the completion of this chapter you should be able to:

• Explain the purpose and content of dietary guidelines
• Discuss dietary guidelines that are based entirely on foods (food-based dietary guidelines) and that include recommendations on nutrients
• Describe the key design features of food guides
• Discuss the challenges in developing a national food guide
• Describe the key features of tables that give recommendations for the intake of nutrients
• Discuss the special challenges that apply to the formulation of various types of dietary recommendations for use in developing countries
• Describe and critically evaluate the key design features of food labels
1. INTRODUCTION

In the previous chapter we discussed the key features of a healthy diet. But in order for this information to be properly implemented, it must first be packaged into a practical format that serves its intended use. In this chapter we examine the various types of recommendations concerning the diet. They are all designed to improve public health and are evidence-based and authoritative.

Different sets of dietary recommendations have emerged since the late 1960s. They are of two main types:

- Dietary guidelines give advice on specific areas of the diet, especially on aspects of the diet where much of the population needs to make dietary improvements. The recommendations may be on particular foods (for example, “choose wholegrain foods”) or on food components (“no more than 10% of energy from saturated fat”).
- Food guides are sets of advice on how to select a diet. They specify how many servings should be consumed from each food group (for example, “eat five servings a day of fruit and vegetables”). They are written for the general population with the aim of being user-friendly.

We also describe recommendations concerning the quantities of essential nutrients that people should consume. Finally, we look at food labels.

The major goal for readers of this chapter is to understand the various types of dietary recommendations and food labels, including the advantages and disadvantages of the designs used in different countries. The reader then needs to apply these lessons to his or her own country.

2. DIETARY GUIDELINES

Around the world, different agencies publish sets of dietary guidelines that are aimed at the improvement of population diets. Here we look at some examples.

2.1 The World Health Organization and the Food and Agriculture Organization

In 2002, the World Health Organization (WHO) together with the Food and Agriculture Organization of the United Nations (FAO) published their dietary guidelines (Nishida et al., 2004). The focus here is on nutrient intakes rather than dietary intake. The recommendations for total fat and carbohydrate are 15% to 30% and 55% to 75% of energy, respectively. The upper limit of 75% for carbohydrate, which is a high figure, reflects the fact that the target populations for WHO and FAO include the populations of developing countries, who typically consume large amounts of high-carbohydrate staple foods, such as rice. Other recommendations, as a percentage of total energy, are 10% to 15% protein, <10% sugars (including those present in fruit juice), 5% to 8% polyunsaturated fatty acids, 1% to 2% omega-3 fatty acids, <10% saturated fatty acids, and <1% trans-fatty acids. Salt intake should be <5 grams/day. There is no specific recommendation for dietary fibre but rather a general recommendation for fruit and vegetables to total at least 400 at least 400 grams/day, plus wholegrain foods.

2.2 Dietary Guidelines in the USA

In highly developed countries the primary goal of dietary guidelines is to serve as a tool to help reduce the impact of chronic diseases of lifestyle (CDL). This is illustrated by dietary guidelines from the USA, such as those from the American Heart Association (AHA, 2006) and the Dietary Guidelines for Americans (USDA, 2010). For the most part, these guidelines are similar to the WHO/FAO guidelines. One notable exception is that the Dietary Guidelines for Americans sets a higher level of acceptable intake for fat (20% to 35% of energy versus 15% to 30%). It also recommends that intake of alcohol be no more than one drink a day for women and two per day for men. A new version of Dietary Guidelines for Americans is scheduled for release in late 2015.

The above dietary guidelines include several recommendations that focus on nutrients, such as setting a target for salt intake of <5 grams/day. Recommendations of this type are intended mainly for health professionals. However, the aim is that the advice is disseminated to the general population.

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2.3 Food-based Dietary Guidelines

Other sets of dietary guidelines are based entirely on foods rather than nutrients; they are therefore referred to as food-based dietary guidelines (FBDG). They are written in clear, simple language, are non-quantitative, and can be understood by the general public. They are culturally sensitive and take the customary dietary pattern of consumers into account. This approach to formulating dietary recommendations has been widely recommended (WHO, 1998; Mozaffarian & Ludwig, 2010). The FAO has compiled a website that gives the FBDG used in many countries around the world (FAO, 2010). Here are some examples.

The dietary guidelines used in the UK are called *Eight Tips for Healthy Eating* (NHS, 2010):

1. Base your meals on starchy foods.
2. Eat lots of fruit and vegetables.
3. Eat more fish.
4. Cut down on saturated fat and sugar.
5. Eat less salt.
6. Get active and maintain a healthy weight.
7. Don’t get thirsty.
8. Don’t skip breakfast.

In contrast to the dietary guidelines used in the UK, those used in developing countries often contain statements such as, “Drink lots of clean, safe water,” “Foods consumed should be safe and clean,” and “Use only iodized salt.” Here are the FBDG used in Namibia, which are typical of those from developing countries:

1. Eat a variety of foods.
2. Eat vegetables and fruits every day.
3. Eat more fish.
4. Eat beans or meat regularly.
5. Use wholegrain products.
6. Use only iodized salt, but use less salt.
7. Eat at least three meals per day.
8. Avoid drinking alcohol.
9. Consume clean and safe water and food.
10. Achieve and maintain a healthy body weight.

We can summarize the merits and purpose of the two types of dietary guidelines – nutrient-based and food-based – as follows. FBDG are clearly superior for transmitting nutrition advice to the general public because the information is easy to understand and put into practice. Providing dietary guidelines that include recommendations on nutrients, such as sodium, sugar, omega-3 fatty acids, and trans-fatty acids, is also useful, but for the specific purpose of helping nutrition professionals to evaluate diets and design healthier diets. A central element of all dietary guidelines is that the recommendations are consistent with our research knowledge concerning the relationship between diet and disease.

3. FOOD GUIDES

Numerous countries have published food guides that provide advice on the overall diet for the general public. All such guides promote a healthy balanced diet. Several of these were reviewed by Kaufer-Horwitz and colleagues (2005). While the various food guides have many differences in their designs, they all share the underlying aim that dietary guidelines need to be expressed in terms of foods and in clear, simple language. Food guides tend to centre on a coloured diagram or poster. Several examples are described below.
3.1 United States

Until 2005 the official food guide for the general public in the USA was the Food Guide Pyramid. As the name suggests, food groups were arranged in the shape of a pyramid: the foods to be consumed in largest quantities covered the most area and formed the base; such items as fats and oils occupied a small area at the peak. It was a simple matter to look at this one-page document and determine how many servings should be eaten from each food group.

From 2005 to 2011 the food guide used in the USA was MyPyramid. Unlike the Food Guide Pyramid, MyPyramid required the use of the Internet. The user entered his or her profile (sex, age, and physical activity) and then received a set of individualized diet recommendations. What probably killed this food guide was the realization that while people are generally willing to read a simple, printed food guide, many of them are not prepared to go to the additional trouble of consulting a website, especially if they do not own a computer or have an internet connection.

In 2011, MyPyramid was replaced by an easy-to-understand pictorial design called MyPlate (USDA, 2011). The diet is depicted as a plate with food sectors. Unlike the previous food guides it places little emphasis on how many servings should be eaten from each food group each day. Instead it focuses on types of recommended foods and the proportions of each group that should make up each meal.

3.2 Canada’s Food Guide

Canada’s Food Guide (Health Canada, 2007) is based on a chart and is simple to use. There are several notable features. The recommended number of servings of fruit and vegetables (which are combined together in one food group) exceeds that for grains. Supplements are specifically recommended for particular groups. Because Canada has a northern location and a cold climate, lack of vitamin D is a major concern. For that reason, people over age 50 are advised to take 400 IU (10 μg) per day of the vitamin. In addition, a multivitamin containing folic acid is recommended for women who could become pregnant and those who are pregnant or breast-feeding.

Anyone wishing to use this food guide should request a printed copy, as this is much easier to read than via the Internet. Copies can be requested from Health Canada, for example via their website: www.hc-sc.gc.ca/fn-an/food-guide-aliment/index-eng.php.

3.3 United Kingdom

The UK’s Eatwell Plate is a pictorial food guide (NHS, 2011). It shows the proportion and types of foods that are needed to make up a healthy balanced diet. The food guide is depicted as a plate with food sectors, similar to MyPlate in the USA. It resembles the Canadian guide in that fruit and vegetables are combined into one group. Fatty and sugary foods are included in the pictorial representation.

3.4 Challenges in Developing a Food Guide

We have now looked at a few of the food guides that are available. If followed, then a diet based on any of these food guides will almost certainly provide all required nutrients in amounts that meet recommendations. One problematic nutrient is vitamin D, which is discussed in Chapter 13. There are several other issues in the design of food guides, demonstrated by the differences between the various food guides. Unfortunately, in most cases there are no obvious right or wrong solutions.

An important difference concerns the use of quantitative recommendations. These are included in the food guides used in some countries, such as Canada, but several food guides used in different countries, including the new MyPlate (USA) and the Eatwell Plate (UK), give very little attention to numbers of servings. Many would argue that specifying the recommended numbers of servings might assist consumers in selecting a healthier diet. However, to what extent people actually follow the recommended amounts is not known.

Fruit and vegetables are grouped together in some guides, such as those from Canada and the UK, but are in separate groups in others, such as the USA. Potatoes go with other vegetables in the USA and Canada, but in some countries potatoes and other root vegetables are given their own group distinct from other vegetables. Several countries include potatoes with grains. Placing potatoes separately from other vegetables is probably

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sensible as potatoes are poor in phytochemicals, have a high glycaemic index, and are often consumed as French fries (chips) and may therefore have a high content of oxidized fat.

Another inconsistency is in the placement of legumes. In Canada, beans are included with meat, hence the name of that food group: “meat and alternatives.” MyPlate, by contrast, allows beans to be counted with either “protein foods” or with vegetables. This schism in the placement of legumes reflects the fact that legumes are a low-fat, protein-rich alternative to meat but are also a good source of fiber and various nutrients such as folate.

The American and Canadian food guides emphasize that grain products should be made from whole grains rather than from refined grains. This welcome trend has emerged in recent years. However, the food guides could still be improved by stating this more strongly.

One problem with food guides is that manufactured products often contain mixtures of diverse foods, along with added sugar or salt. This can make it confusing for users to categorize foods. For example, ham and pineapple pizza contains wheat (a grain) plus a modest amount of meat and fruit along with an excess of salt. The food therefore belongs in three separate food groups while also requiring that a person who eats this food should be aware of the salt content.

Nutritionists who are involved in developing a food guide need to carefully assess the above issues and determine what makes most sense in the specific conditions of their particular country. A food guide needs to have the following features:

- It is written in clear, simple language so that most people in the target population can easily understand it.
- It is based on foods that are widely available in that country.
- Its design and key messages must be acceptable to the target population.
- It must be sufficiently flexible so that it caters to different groups within the population, such as vegetarians or ethnic minorities who have different food preferences.
- It is designed to deal with the major nutrition problems of that country, whether these be undernutrition, overnutrition, or both.

As national diets around the world continue their rapid evolution, the food guides also need to evolve.

### 3.5 Traffic Lights Food Guide

The Traffic Lights Food Guide was developed by the authors of this chapter (Temple & Bourne, 2010) and is based on a traffic light design. It is intended to be simple to use and has major differences from the food guides discussed above.

Food guides typically categorize foods into two broad classes: (1) those that are recommended and (2) those that should be eaten only in limited quantities. But nutrition science informs us that many foods belong somewhere in between. For that reason, the Traffic Lights design divides food into three classes. Within each food group, foods are categorized as follows:

- Green – eat freely within the limits indicated,
- Amber – eat in limited amounts, or
- Red – these are treats; eat little or none.

The food guide is a logical development of Traffic Lights food labels, which have been adopted by some supermarket chains in the UK and other countries (Food Standards Agency, n.d.). The food guide, which is shown in Figure 14.1, could be adapted for developing countries. Unfortunately, little research has been done to determine whether the Traffic Lights design will lead to people eating a healthier diet. It is therefore a matter of speculation as to whether this design has advantages in comparison with the type of food guides discussed earlier.
Eat a mixture of foods from the different food groups while carefully following the rules given below:

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Green (eat freely within the limits indicated)</th>
<th>Amber (eat in limited amounts)</th>
<th>Red (eat little or none)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruit and vegetables</td>
<td>Nearly all fruits and vegetables</td>
<td>Potatoes, fruit juice</td>
<td>Chips (French fries)</td>
</tr>
<tr>
<td>Grain products</td>
<td>Whole grains, such as whole-wheat bread, oats, dark rye bread, and popcorn</td>
<td>Refined cereals, such as white rice, white bread, and corn flakes</td>
<td>Biscuits, cakes, popcorn with salt and/or butter</td>
</tr>
<tr>
<td>Milk products</td>
<td>Skim and 1% milk, fortified soy milk</td>
<td>2% milk, low-fat cheese</td>
<td>Whole milk, regular cheese, cream cheese, ice cream</td>
</tr>
<tr>
<td>Meat, fish, beans, nuts</td>
<td>Fish, beans, lentils, nuts</td>
<td>Lean beef, chicken</td>
<td>Bacon, red meat (all beef and pork products unless labeled as lean), eggs</td>
</tr>
<tr>
<td>Oils, fats</td>
<td>Most vegetable oils, soft margarine (preferably from canola oil or soy oil)</td>
<td></td>
<td>Hard margarine, butter</td>
</tr>
</tbody>
</table>

**Key Rules for a Healthy Diet**

1. Eat only enough to satisfy your appetite. If you are gaining excess weight or you wish to lose weight, then eat less, and exercise more.
2. Eat 5 to 10 servings per day of grain products. Of this, at least 3 servings (preferably more) should be whole grains. One serving is equal to a slice of bread, a cup of breakfast cereal, or half a bagel.
3. Eat 5 to 10 servings per day of whole fruit and vegetables. One serving is equal to an apple, a banana, a cup of salad, or half a cup of other vegetables. In addition, up to 1 cup of juice (2 servings) may be consumed. Aim for a mixture of different types of fruit and vegetables. Fresh or frozen is better than tinned (canned).
4. Consume 2 or 3 servings per day of milk products (more for adolescents and women who are pregnant or breast-feeding). One serving is equal to 1 cup of milk or yogurt or 45 grams of cheese.
5. Consume 1 to 3 servings per day of meat, fish, beans, peas, lentils, and nuts. A serving is equal to 90 grams of fish or meat or half a cup of cooked beans.
6. Aim for about 3 teaspoons per day of margarine, oils, and salad dressing, or double that if you eat little or no other sources of polyunsaturated fats, such as nuts or fish.
7. Minimize your consumption of sugar. This includes sugar in coffee and soft drinks. Also minimize your consumption of foods rich in both fat and sugar, such as biscuits and cakes.
8. Cut down on salt. Remember, most salt in the diet comes from processed foods, such as most types of bread, margarine, and tinned foods.
9. It is OK to consume alcohol provided that this is done responsibly. Never drink and drive, never drink if pregnant, and don’t get drunk. An acceptable intake is 1 drink per day for women and 2 drinks per day for men.

**Figure 14.1:** Traffic Lights Food Guide  

4. **RECOMMENDATIONS FOR NUTRIENT INTAKE**

Numerous countries produce tables of the recommended intake of nutrients. These are intended primarily for health professionals.
4.1 United States and Canada

The Recommended Dietary Allowances (RDAs) are estimates of the daily amounts of nutrients considered necessary to meet the needs of most healthy people. The RDAs have been in use in the USA for several decades. In the late 1990s, a new set of recommendations was formulated, called the Dietary Reference Intakes (DRIs). DRIs were developed jointly by the USA and Canada. The RDAs are now part of the DRIs. For those nutrients for which there is insufficient information to establish a RDA, less exact estimates are made, known as Adequate Intakes (AIs). Values of RDAs and AIs are given for fourteen vitamins, fifteen minerals, energy, carbohydrates, essential (omega-3 and omega-6 polyunsaturated) fatty acids, protein, dietary fibre, and water. Tables are broken down by age and sex. Specific recommendations are given for women who are pregnant or lactating. A simplified version of these tables is given in Appendix III. For the full tables, go to http://fnic.nal.usda.gov and then click on “Dietary Guidance.” This is the website of the Food and Nutrition Information Center (FNIC) which is part of the U.S. Department of Agriculture.

4.2 Other Countries

Other countries use variations of the above system. Often only one set of values are given for nutrient intake recommendations, the equivalent of RDA, although different terms are used by different agencies. The FAO, together with the WHO, uses the term Reference Nutrient Intake (RNI), which it defines as “the daily intake which meets the nutrient requirements of almost all (97.5%) apparently healthy individuals in an age- and sex-specific population” (FAO/WHO, 2004).

4.3 Comment

The values given for the recommended intake of nutrients reach the public in different ways. In particular, they are at the heart of national dietary recommendations. This means that food guides are designed so that a person who follows them should obtain enough of every nutrient. Of course, vast numbers of people in developing countries, and many people in developed countries, eat a diet that falls well short of dietary recommendations. As a result, nutrient intakes are frequently far below the recommended intake for numerous nutrients. In order to investigate this, findings from diet surveys can be interpreted by comparing actual intake of nutrients against recommended values. By this means a nutritionist/dietitian can determine whether deficiencies of particular nutrients pose a problem. Such an analysis is crucial for making a proper assessment of the dietary status of both individuals and populations. The findings can then serve as the basis for planning nutrition interventions.

Nutrient intake recommendations also play an important role in creating food labels, which help consumers determine how much of a particular nutrient is present in a serving of a particular food. This is discussed below.

5. APPLICATION OF VARIOUS TYPES OF DIETARY RECOMMENDATIONS

We have now examined various types of dietary recommendations. Each type serves a specific function. We will now briefly summarize them:

- Recommendations concerning the intake of vitamins and minerals have been in use for several decades. They are important when evaluating diets.
- Dietary guidelines are intended to help improve population diets. Some dietary guidelines focus on nutrients, such as that salt intake should be <5 grams/day. Dietary guidelines of this type are mostly intended for use by health professionals.
- It is now increasingly recognized that a focus on the intake of nutrients tells only part of the story: we eat food, not vitamins and minerals. Trying to design a diet based on values for recommended intake of nutrients is extremely complex. It is important, therefore, to look at the diet as a whole. Food-based dietary guidelines (FBDG) are developed after carefully evaluating the major dietary problems in a country.
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and then formulating general advice on key aspects of the diet. The main goal of FBDGs is the improvement of population health, such as the prevention of chronic diseases. They must be written in clear, simple language and be readily understood by the general public.

- Food guides go one step beyond FBDG and tell people how to eat a healthy diet.

6. FOOD LABELS

6.1 The Use of Food Labels

Many countries have regulations that specify what labels must be affixed to a package of food when it is sold. Generally, the labelling regulations only apply to food that is sold in packages, such as tins or cardboard boxes, whereas many foods that are not pre-packaged, such as bread, meat, and fish, do not require a label. The following description of food labels applies specifically to North America, although many other countries have similar systems. Labels are of two types:

- Front-of-package labels inform the buyer of the brand name and the type of food, such as Kellogg’s Cornflakes.
- Back-of-package labels provide details of the composition of the food, such as 255 mg sodium per 45 g serving. To help the consumer interpret the information, the amounts are also stated as a percentage of recommended daily intake (RDI). This part of the label also lists the ingredients in the food in order by weight (main ingredient first).

6.2 Problems with Food Labels

Around the world, food labels can be a source of confusion for consumers (Temple & Fraser, 2014). Here are the major problems:

- Front-of-package labels often give misleading names to soft drinks. In North America, only pure fruit juice can be called “juice.” However, there are numerous imitation juice products that contain no more than 20% actual juice; many contain no juice at all. These pseudo-juice products are, in reality, sugar solutions with added flavours and colours. They are little different from other sugar-rich soft drinks, but they have misleading names such as “fruit beverage.” Adding to the confusion, the brand name may also be suggestive of real fruit, naturally grown (e.g., Sunny Delight).
- The back-of-package label lists the ingredients in the food in order by amount but does not normally give the actual amount of each ingredient. Here is what this can mean in practice: A manufacturer sells a juice containing mainly apple juice, which is cheap, with some added berry juice, which costs much more. However, as many customers prefer berry juice, the front-of-package label will likely say, in large letters, “made with real berries” and feature prominent images of berries. Even if the customer realizes that the front-of-package label is deceptive and looks at the back-of-package label in an effort to determine precisely how much berry juice is present, the latter will be impossible.
- Another common problem with back-of-package labels is that they typically mix together food components the intake of which should be limited (such as sodium, sugar, and saturated fat) and food components that are often lacking in the diet (such as fibre and omega-3 fatty acids). This makes the label less easy to understand.
- Yet another problem is that labels for similar products often use different serving sizes, thereby making it difficult for consumers to compare them.

Imagine a typical shopper in a supermarket who is selecting a brand of breakfast cereals. The time spent evaluating each of the choices on offer is generally no more than a few seconds. For that reason it is the front-of-package labels that dominate decision-making, but, as we have seen, those labels can be quite misleading. Even if the shopper makes a determined effort to study the back-of-package labels in order to make a careful choice, he or she might easily end up being confused by the information. Indeed, research studies have revealed that the majority of people have problems understanding food labels (Cowburn & Stockley, 2005). This is especially the case with older adults and those with less education. Moreover, these studies were
conducted in various Western countries. People in developing countries typically have less years of education than in Western counties, and therefore the labels are likely to be even more problematic. In addition, there may be language barriers. Accordingly, the food labels described above are likely to have limited value for large sections of the population in many developing countries.

6.3 Improved Designs for Food Labels

Clearly, the types of food labels used in many countries mean that consumers are not being given the information they require, in a user-friendly format, in order to make informed choices as to which food items are healthiest. In response to these problems several new designs have been developed (Temple & Fraser, 2014).

An alternative system that shows much promise has been developed in Britain and is based on the Traffic Lights Food Guide (Food Standards Agency, 2013). With this system, coloured circles are placed on the front of the pack and show at a glance if the food has a high (red), medium (orange), or low (green) content of fat, saturated fat, sugars, and salt. The label also indicates the actual quantity of these substances per serving. This system is simpler than the type of system described above. Research studies have been carried out in which consumers have been asked to compare Traffic Lights labels with other front-of-package label systems. In general, Traffic Lights labels are well liked and are very effective for helping people to assess how healthy a food is (Hersey et al., 2013).

One possible improvement to this system is to add an extra “traffic light” to indicate the global health value of a food (Temple, 2014). Such a system requires a standardized methodology for comparison of diverse foods. Several such systems have been proposed (Drewnowski & Fulgoni, 2008; Scarborough et al., 2007).

Other tests have been conducted using even simpler front-of-package labels that summarize the global health value of a food as a number of stars (or a similar symbol). Healthier products are given more stars. This format provides less information than Traffic Lights labels but it scores even better in terms of allowing people to correctly identify which foods are healthiest (Feunekes et al., 2008).

Traffic Lights labels and other simple systems may be especially valuable in developing countries because they do not require any ability at arithmetic from shoppers. Setting up an easy-to-use system for nutrition labelling in developing countries is obviously a challenging enterprise. The food labels used in each country should be carefully designed and based on local factors, such as: the major nutrition-related health challenges (undernutrition or overnutrition), the level of education (telling people the sodium content of food is not much use if most people are unable to interpret this information), and the types of foods sold (unwrapped food sold at outdoor markets or food in packages and tins sold in supermarkets).

DISCUSSION QUESTIONS AND EXERCISES

1. The health department of your national government has decided to establish new regulations for food labels. Based on the situation in your country, write a letter describing the design of food labels that you consider to be most appropriate. Provide supporting arguments.

2. Your country already has a food guide. It has been suggested that FBDGs should also be developed and published. Discuss the merits of this proposal.

3. You are developing FBDGs for use in your country. Examine the FBDGs used in the UK (see section 2.3). Suggest one or two additional guidelines that are not included in those guidelines but that should be included in FBDGs for use in your country.

4. Various designs of food guides have been described in this chapter. Which one is most appropriate for use in your country? Explain your answer.

REFERENCES


ADDITIONAL RESOURCES


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