

# What Foods to Donate During a Disaster?

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# The problem

## Problem Statement

We wanted to determine the usability of a donated food for a disaster relief effort. Develop a model to predict a donation usability score based on nutritional data plus storage factors to account for prep/storage (i.e., lean meats are high in nutrition but do not travel well vs. nuts that are high in nutrition and travel well).

# Target

## Target Audience

This presentation was geared toward a non technical executive audience of policy decision makers.

# Data Selection/Preparation:

## Data Selection

USDA National Nutrient Database was the base data, and a recent version was located on Dataworld. This file contained approx. 8.5K raw records.

## Data Preparation

Loaded, inspected, cleaned, and imputed the data for missing values.

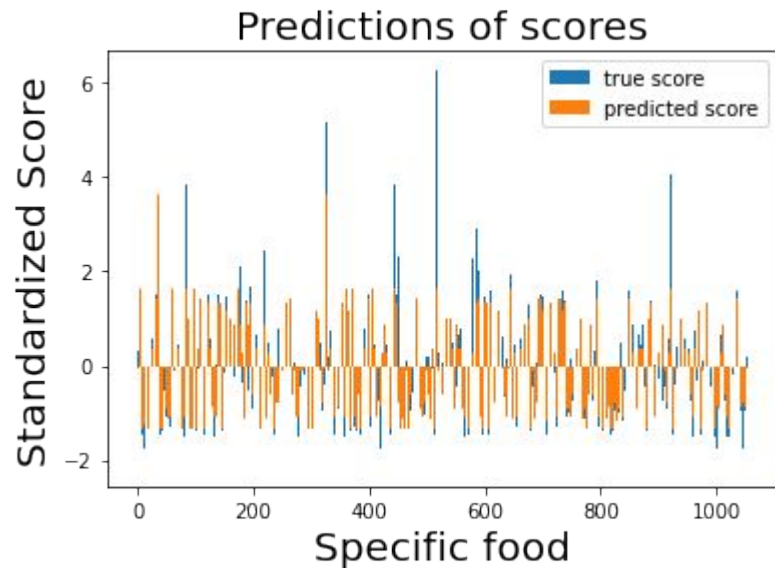
Issue with some data not being assigned a USDA category.

# Scoring

- Created a function that calculates nutritional value based on 12 categories of nutrients present such as protein, magnesium, and Zinc.
  - Applied a food group level storage value to account for foods that would need refrigeration (25 records with examples such as Dairy and Egg Products, Nut and Seed Products, Restaurant Food)
  - Nutritional score calculation combines this nutritional score elements and the donation score was derived by a log score.
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# Modeling Summary

Model Type	Features	Test Score
Linear Regression	Vitamins, Protein & Food Group	0.97
Linear Regression	Food Group	0.745
Nearest Neighbor	Vitamins, Protein, & Food Group	0.96



# Best Performing Food Group

Food Group	Score
Nuts & Seeds	17
Cereal & Breakfast	16
Beverages	16

# Recommendations

- Classifying which foods are “healthy” or “not healthy” is not a straightforward process so do more studies on nutrition and ways to analyze food.
  - We recommend foods with long shelf life & high nutrition
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# Implementation

- Streamlit application

# Food Donation Classifier

Should you donate your food?

Please input information about your food below.

What is the food item?

Cereal

What is the type of food?

Breakfast Cereals

We recommend donating this food.

# Future Enhancements

Create a better model that uses the short description to take into account common name of food.

Have different storage values within a food group.

Expand model to account for cultural preference and preparation.

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# References

## **Percent daily value - Canada.ca**

<https://www.canada.ca/en/health-canada/services/understanding-food-labels/percent-daily-value.html>

The percent daily value (% DV) found in a nutrition facts table can help you make informed food choices. Learn how to use % DV to choose healthier foods.

## **PubMed Central (PMC)**

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4489367/><https://academic.oup.com/ajcn/article/82/4/721/4607427><https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4462757/#ref3><https://www.canada.ca/en/health-canada/services/understanding-food-labels/percent-daily-value.html>

## **Food selection criteria for disaster response planning in urban societies**

Nutrition professionals that have menu planning and disaster management responsibilities should consider factors that have transcended from ancient to current times, in addition to recognizing societal trends that have led to our current increased vulnerability ...

## **PubMed Central (PMC)**

## **Evaluation of a nutrient-rich food index score in the Netherlands**

Nutrient-rich food (NRF) index scores are dietary quality indices based on nutrient density. We studied the design aspects involved in the development and validation of NRF index scores, using the Dutch consumption data and guidelines as an example.