Recommendations for an intelligent diet

Keana Richards PhD SAS
Jeesung Ahn PhD SAS
Tonatiuh Salas W21

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Jeesung Ahn PhD SAS
Tonatiuh Salas W21

Wharton
UNIVERSITY *of* PENNSYLVANIA

Goal of Study: Identify clusters of foods based on nutrient profile

- Food items in a certain group may not necessarily have the same nutrient profile

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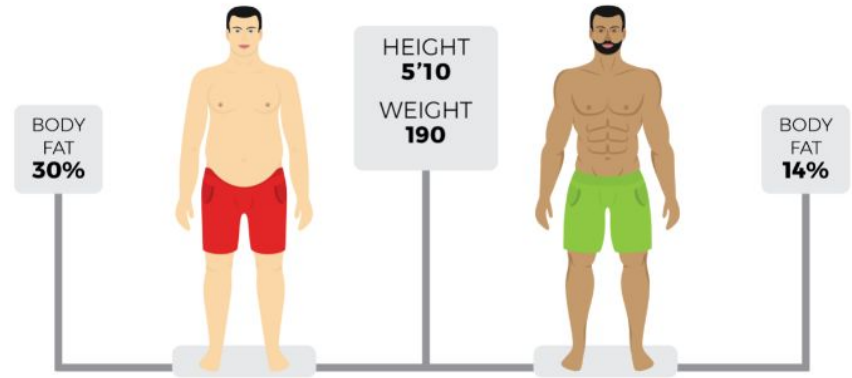- Find foods that have the best combination of nutrients based on a person's dietary needs

Potential uses: A new food-grouping scheme could be beneficial across contexts

- Sports nutrition

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- Muscle gain and fat loss

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- Sports nutrition

- Muscle gain and fat loss

- Medical treatment

Data & EDA

Data: Canadian Nutrient File (2015)

- Average nutrient profiles for foods available in Canada

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- Total of 5690 unique foods & 152 nutrients available

EDA

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- Some nutrients are redundant
  - eg kilocalories and kilojoules

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- Many missing nutrients

Analyses

Comparing different approaches to grouping foods

- Want to maximize within-group similarity while minimizing between-group similarity

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Comparing different approaches to grouping foods

- Want to maximize within-group similarity while minimizing between-group similarity
- K-means clustering
- Spectrum clustering

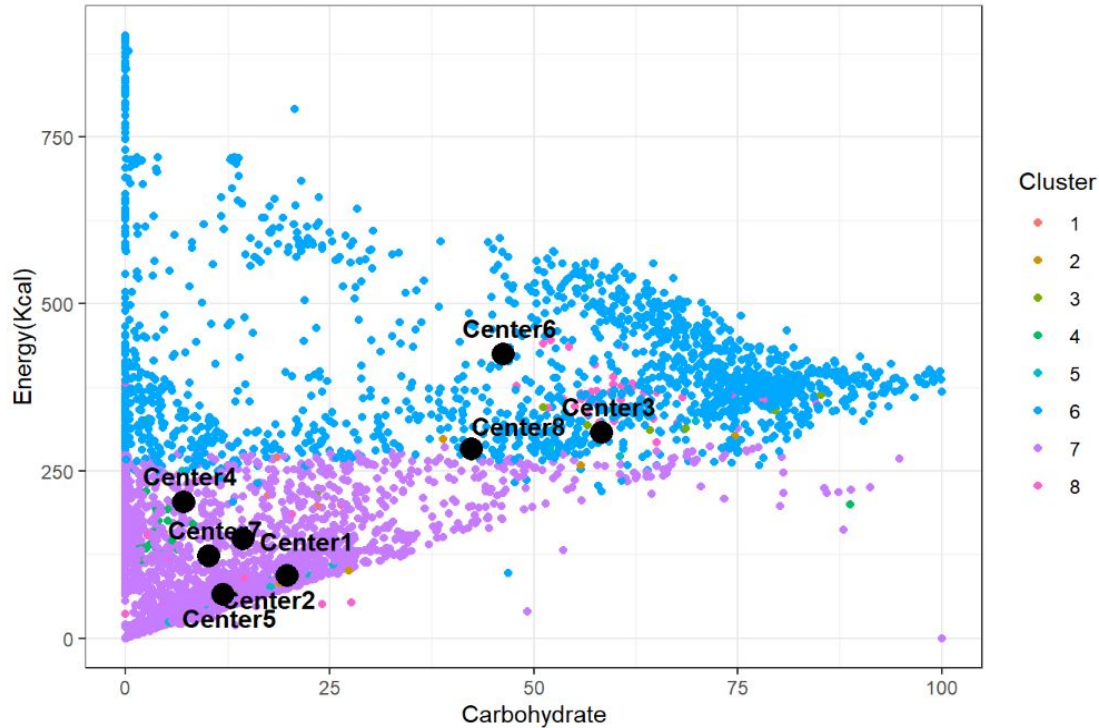# Comparing different approaches to grouping foods

- Want to maximize within-group similarity while minimizing between-group similarity
- K-means clustering
- **Spectrum clustering**

Findings

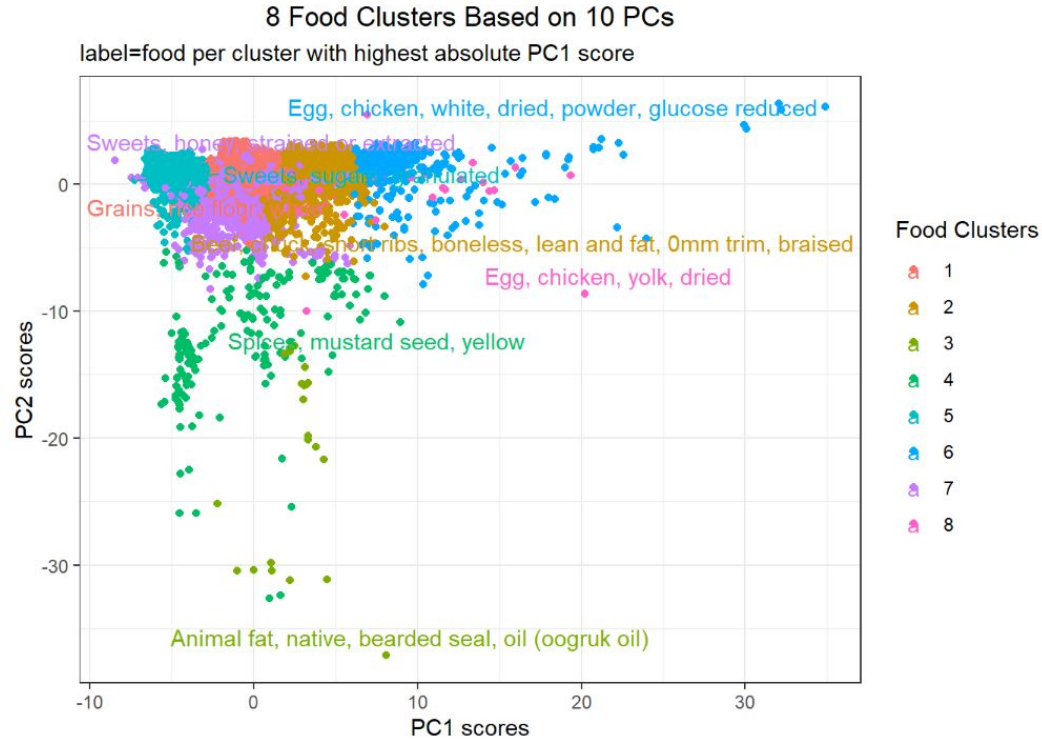# K-means clustering vs. spectrum clustering

K-means clustering vs. spectrum clustering

Clustering over randomly chosen two variables

Total WSS: 2.18^9

K-means clustering vs. spectrum clustering

8 Food Clusters Based on 10 PCs

label=food per cluster with highest absolute PC1 score

Egg, chicken, white, dried, powder, glucose reduced

Sweets, honey, strained or extracted

Sweets, sugars, granulated

Grains, rice flour, white

Beef, chuck, short ribs, boneless, lean and fat, 0mm trim, braised

Egg, chicken, yolk, dried

Spices, mustard seed, yellow

Animal fat, native, bearded seal, oil (oogruk oil)

Food Clusters

a 1
a 2
a 3
a 4
a 5
a 6
a 7
a 8

Total WSS: 22017

Exploring the "intelligent" clusters

Exploring the "intelligent" clusters

Exploring the "intelligent" clusters

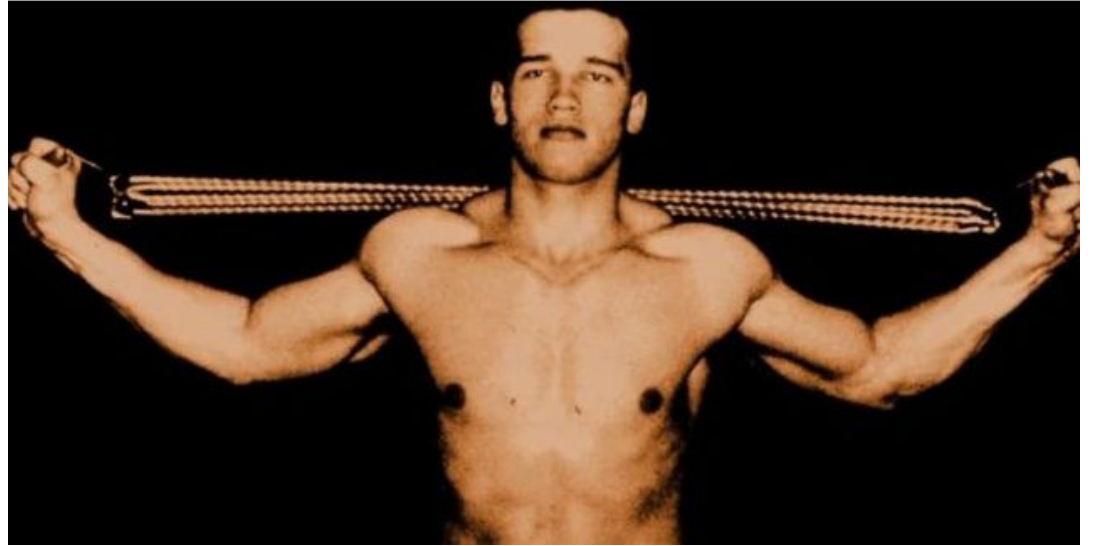Average Kcal of Foods per Cluster
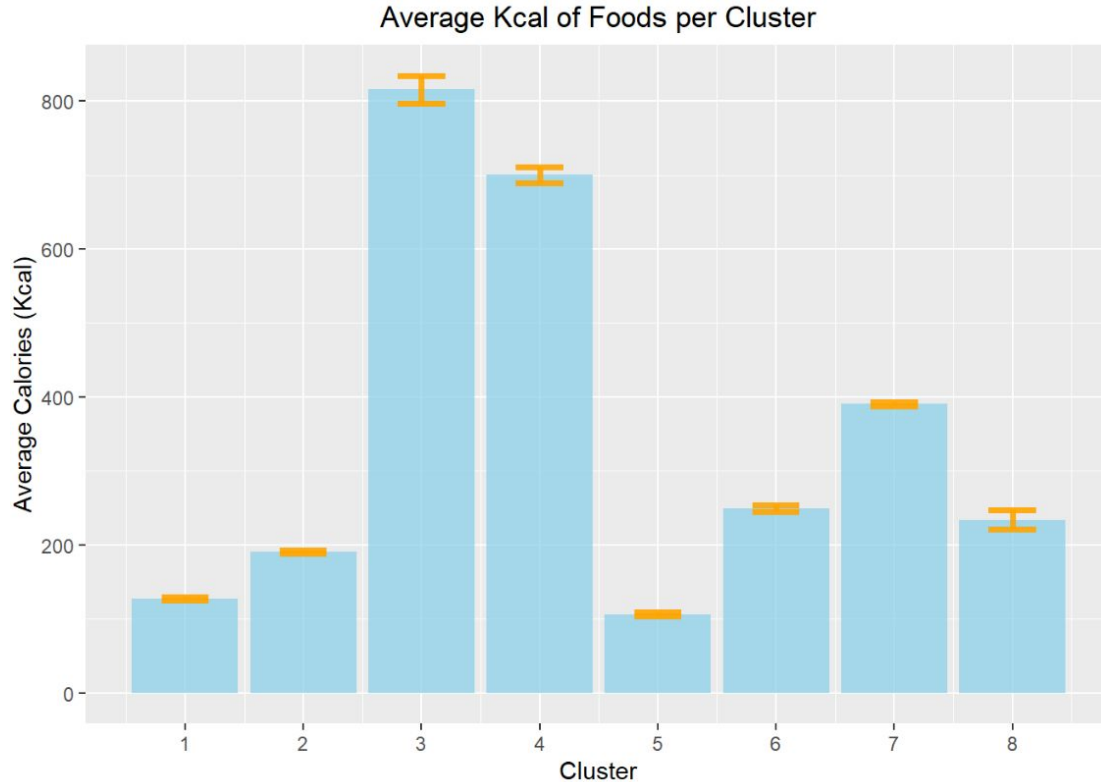
Recommendations

Meet Arnold - aspiring pro bodybuilder
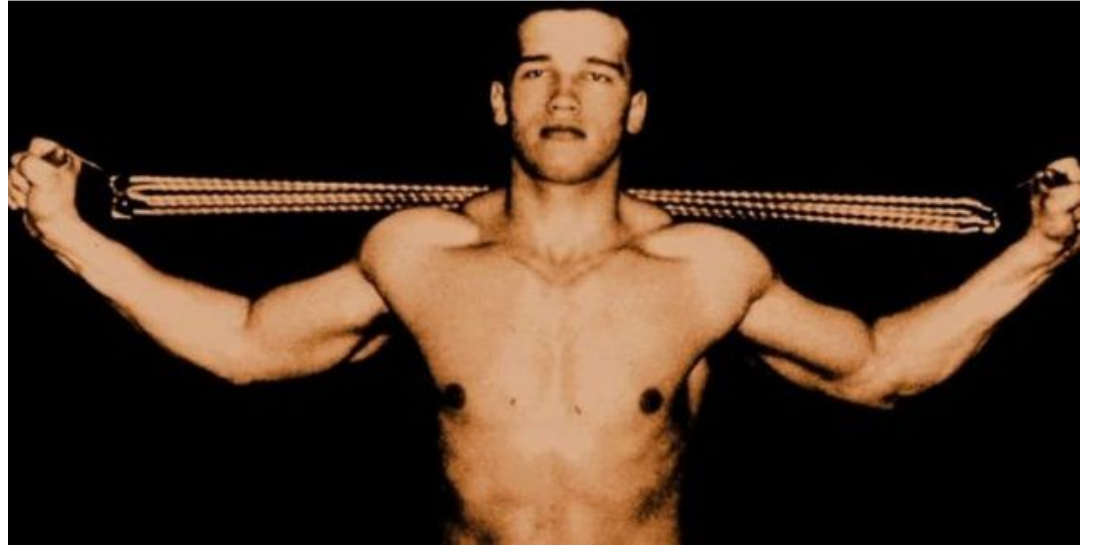
Meet Arnold - aspiring pro bodybuilder
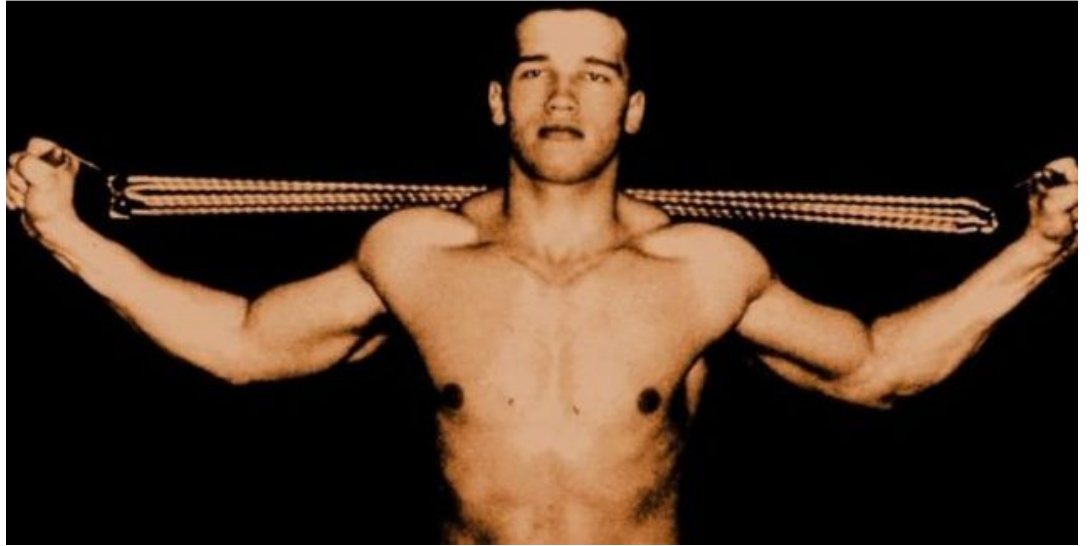
- Protein goal: 270 g/day

Meet Arnold - aspiring pro bodybuilder

- Protein goal: 270 g/day
- Carb goal: 360-540 g/day

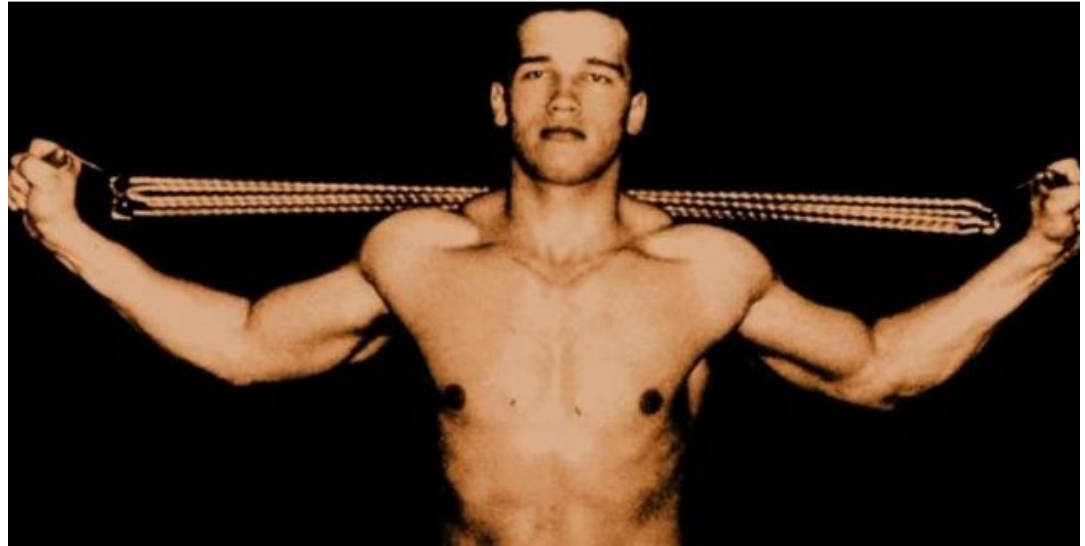# Meet Arnold - aspiring pro bodybuilder

- Protein goal: 270 g/day
- Carb goal: 360-540 g/day
- Calorie goal: 3600 kcal/day

Meet Arnold - aspiring pro bodybuilder

Cluster 5:

- turkey
- brussel sprouts
- pork

Thank you!

Link to code, slides, and database:

tinyurl.com/4x43u439