ABSTRACT: This paper could determine which Starbucks drinks are best for cardiovascular disease prevention and overall good health. A Science-based Health Index was constructed considering different coffee/tea constituents, including: saturated fat, cholesterol, sodium, carbohydrates, dietary fiber, sugars, protein, and caffeine. 1. Adopt STEAMS (Science, Technology, Engineering, Artificial Intelligence, Mathematics, Statistics) Methodology 2. Antioxidant activity of flavonoids from Caffeine contained within Coffee/Tea can reduce free radical formation and scavenge free radicals. 3. Science-based Health Index (about 70%-80% R-Square Curve Fitting).

- Loadings plots of the first two principle components are quite different each other.

STEAMS ASPECT

- Science: Study Coffee/Tea Antioxidant CARDIOVASCULAR DISEASE (CVD)
- 2. Technology: coffee and tea process an
- 3. Engineering: derive "health index" mode consumers to select healthy product
- 4. Artificial Intelligence: Principal Compor Analysis
- Math: Linear Algebra and Eigen Analysis
- 6. Statistics: linear fit correlation, regressi

Science-HEALTHINDEX

Science- Health Index was develop basis of each of the input variables dataset, taking into account the Scientif and applying weighting coefficients wit or negative sign depending on whether to (negative) heart disease prevention.

GINEERI

R

Science-Health Index =-2 * Calories + -2 * + -2 * "Saturated Fat" + -2 * "Choleste "Sodium" + -1 *"Total Carbohydrates" + 2 Fiber" + -2 *"Sugars") + 1 * "Protein" + 2

CONCLUSIONS: this paper has utilized the Principal Component Eigen Analysis to study the Coffee and Tea nutritions to determine the health index. "STEAMS" approach is very successful on understanding chocolate health research. The first two principal components have contributed to 79% variance based on Eigenvalues. The first principle component is attributed to the unhealthy nutritions such as Sugars, Total Fat, Cholesterol... The second principle component is more related to the healthy nutritions such as Caffeine and Dietary Fiber. Two health index are derived: (1) by scientific research, and (2) by PCA method. Two different health index methods have about 70%-80% correlation. The PCA method has shown great potential to conduct scientific research. This STEAMS approach can be applied to similar fields such as chocolate product. The loading plots can be utilized to compare different Principal Component Patterns.

Principal Component Analysis of Coffee/Tea Nutrition Research Study by Mason Chen OHS, Stanford University mason05@ohs.Stanford.edu

4. Principal Components Analysis was used to explore all factors on the utility of the health index related to CVD prevention. Principal Component 1 is relevant to most unhealthy components such as sugars, carbohydrates, saturated fat, and total fat. Principal Component 2 is related to healthy Caffeine and Caffeine are opposite against the unhealthy nutritions in PCA biplot. 5. The PCA-based Health Index was derived based on the eigenvalues and eigenvectors of the first two Principal Components. The other Foods like Candy, Chocolate, Cereal are also studied and their Nutrition

	CARDIOVASC	ULA
t and	 Lead to heart dised blood pressure, and 	ase: hig d othe
nd product del for	 problems, including Eat less than 300 m each day, avoid tro 	y type ng of c ans fat
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is	important contribu	tion to
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