

The DyeDiet Food Risk and Nutrition

How YOU and YOUR children may benefit:

- Understanding the DyeDiet Food Safety Risk concept gives you a gauge which helps you to identify and avoid chemical hazards (http://www.foodrisk.org/hazard/chemical/fca/risk_safety/hazard_id.cfm) in your and your child's diet.
- When you feel that you can rely on the DyeDiet analysis you may choose not to try solving the puzzles of ingredient lists. The DyeDiet will analyze and translate it all for you!

Basic definitions

I keep receiving questions with regard to Food Safety Risk Score (DDRS) comparison. This encouraged me to write the present explanation of the principles in a FAQ format:

- What DDRS is? Answer: The DyeDiet Risk Score is a sum of individual Risk Factors (DDRF) assigned to every additive:

$$\text{DDRS} = \text{DDRF}_1 + \text{DDRF}_2 + \text{DDRF}_3 + \dots \text{DDRF}_n$$

- What are “good” or “bad” DDRS values? Answer: There are no “good” or “bad” numbers. Absolute DDRS values taken out of the context do not mean too much. What do matter are **relative** DDRS values when closely related products are compared. Apples to apples, oranges to oranges. Amount of the **red color** on the diagram associated with a DDRS value **is important**. More red segments means more health risks come with foreign chemicals and that is “bad.”
- What about risks which come from nutrients? Answer: Those risks are OK. Nutritional risk factors naturally and inevitably come with even perfectly nutritious food. The only thing you need practicing in response is moderation.

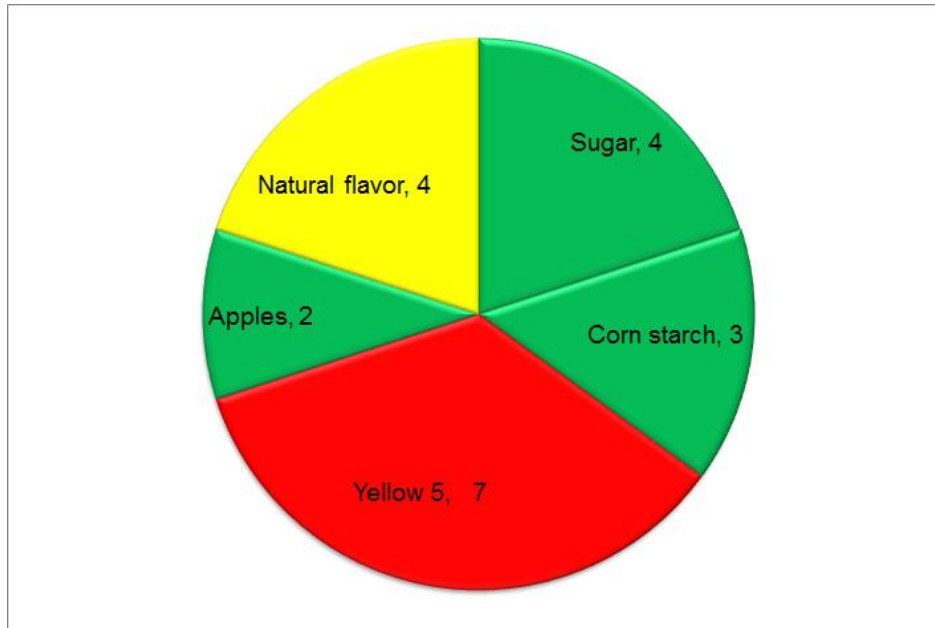
In other words, higher numbers and “red diagrams” is what you look to avoid whereas “green diagram” means it is a nutritional product you may want to buy, no matter how high the DDRS numbers are.

Let us consider illustrative examples below.

Same food category

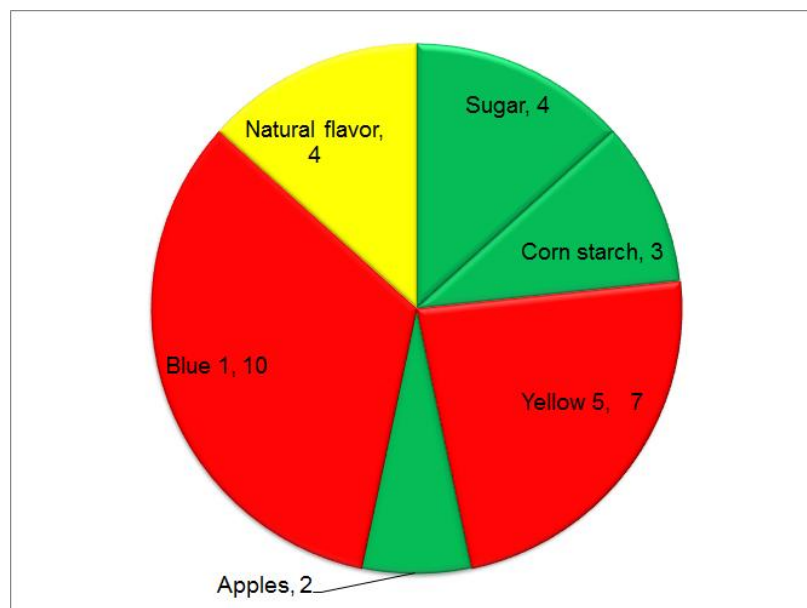
Assume we want to compare Product A and Product B that are closely related as to the similar sets of ingredients. They belong to the same food category.

Product A Diagram, DDRS = 20



Overall health risk comes with 1 benign (yellow), 1 FOREIGN (red) and 3 nutritional (green) additives; $DDRS = 4 + 7 + 2 + 4 + 3 = 20$.

Product B Diagram, DDRS = 30



Overall health risk comes with 1 benign (yellow), 2 FOREIGN (red) and 3 nutritional (green) additives; $DDRS = 4 + 10 + 7 + 2 + 4 + 3 = 30$ What we see from the

comparison of the two diagrams is that higher DDRS value is associated with the larger red “territory” relative to the green nutritional one. The conclusion is obvious: *Product A is less risky to consume because both the DDRS value ($30 > 20$) and the amount of red color ($B > A$) are higher in the diagram B.*

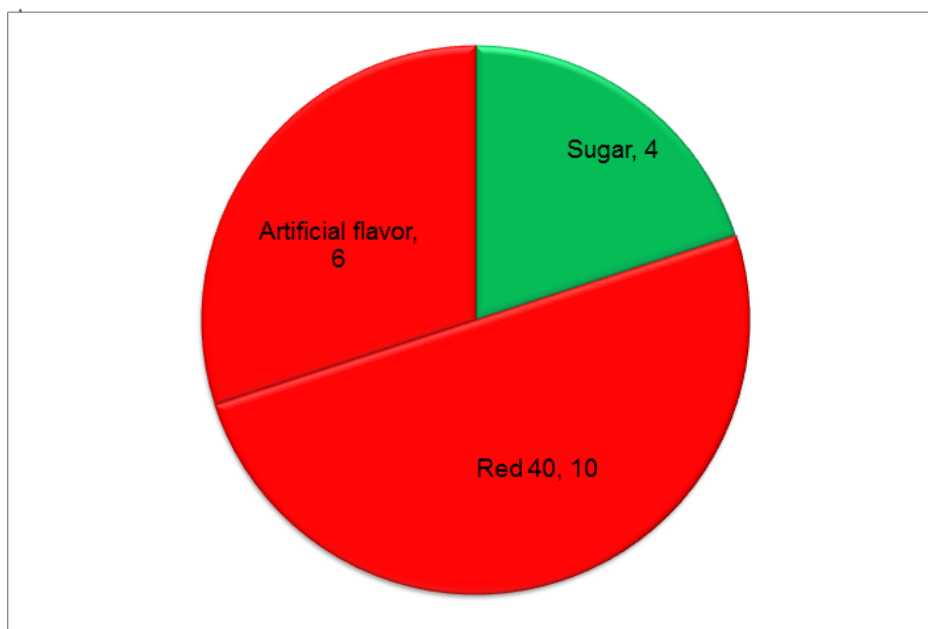
So, when two closely related products are compared, the lower DDRS value the safer is the product.

The above will not be the case for completely different products with different sets of the additives and ingredients.

Different food categories

Let us consider products C and D that belong to different food categories.

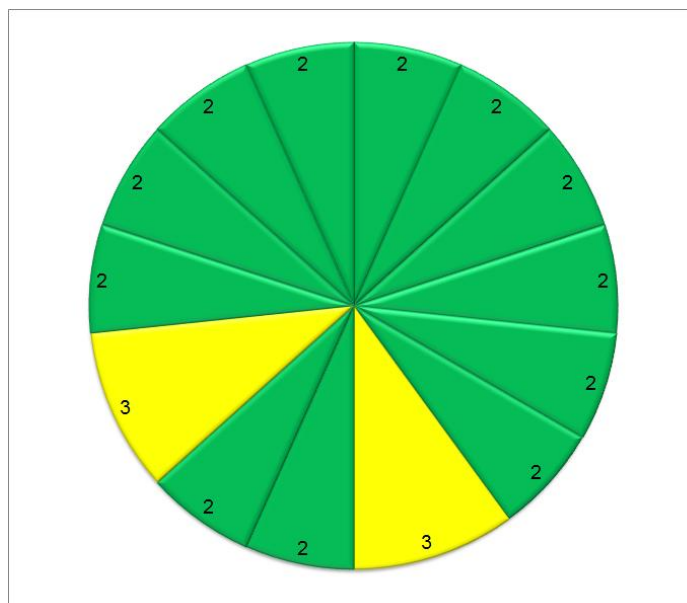
Product C Diagram, DDRS = 20



$DDRS = 10 + 6 + 4 = 20$ where 16 units of health risk come from FOREIGN (red segments) and only 4 from NUTRITIONAL (green segment) additives. The product is “bad” in accord with the above definitions.

Product D Diagram, DDRS = 30

Imaginary Product D consists of 12 nutritional ingredients DDRF 2 each (green segments) and 2 benign additives of DDRF 3 each (yellow segments):



Correspondingly, it's $DDRS = (2 \times 12) + (2 \times 3) = 30$ which is 10 units higher than $DDRS$ of the Product C! What does this mean? Answer: Product D is less risky to eat because its 30 $DDRS$ units come from mostly **GREEN** nutritional ingredients. We see the opposite from the product C diagram which is mostly **RED**. This is the traffic lights association: go – no go (<http://www.eatwell.gov.uk/foodlabels/trafficlights/>).

- An equal or even higher $DDRS$ value that comes from NUTRIENTS (**green**) and benign (yellow) additives means that the product may be harmful only if overly consumed and **may not be harmful in moderation** because all the ingredients can be of use in the human body.
- A $DDRS$ coming mostly from FOREIGN additives means that the product may be harmful **even if consumed in moderation** because foreign additives have no business in the human body.

For a direct comparison of any products from different food categories *a new parameter* should be used. Here it is.

The DyeDiet Foreign Additive Risk Impact (DDFI)

DDFI is simply a ratio of all foreign risk factors $DDRFs$ (red segments) to all nutritional $DDRFs$ (green segments):

$$DDFI = \frac{\text{Foreign } DDRFs}{\text{Nutritional } DDRFs}$$

It does reflect the risks posed by all foreign food additives (like food dyes, artificial flavors, preservatives, etc.) relative to nutrients that are present in a product. For the

most of foods we eat, DDFI will be within the range of 0 to 15 or 20. *The higher is DDFI value the higher is overall health risk and the lower is nutrition value of the food product.*

The DyeDiet Nutrition Factor (DDNF)

The DyeDiet Nutrition Factor (DDNF) is introduced to reflect nutritional value of a food product. It is a ratio of all Nutrition DDRFs (green segments) to a sum of all foreign (red) and benign (yellow segments) DDRFs:

$$DDNF = \frac{\text{Nutrition DDRFs}}{\text{Foreign DDRFs} + \text{Benign DDRFs}}$$

As you may see from the equation, more foreign and benign additives will bring the Nutrition Factor (DDNF) down. Because of generally higher values of foreign food additive risk factors (DDRF) their presence will reduce the overall nutrition value down faster than that of benign food additives. Let us turn back to our examples.

Products A, B, C and D comparison chart

	Foreign DDRF	Benign DDRF	Nutritional DDRF	DDRS	DDFI	DDNF	Recommendation
Product A	7	4	9	20	0.8	0.8	Not really
Product B	17	4	9	30	1.9	0.4	No
Product C	16	0	4	20	4.0	0.25	No
Product D	0	6	24	30	0.0	4	Yes

Again, along with the prevalent color in the diagram DDFI and DDNF numbers clearly indicate:

- Product **D** is safest in the list with green diagram, lowest possible DDFI and higher nutrition factor (DDNF = 4);
- Product **A** is less risky of the three remaining but still is not recommend because it's nutrition factor is still less than 1 (food dye is present), and
- Product **C** is the most potentially dangerous of the four despite low DDRS value. It has high health risks coming from foreign food additives (DDFI = 4) and very low nutritional value (DDNF = 0.25). In reality, this would be the worst example of some junk food.

I hope this helps.