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Nutritional evolution of chocolate bars - 2011

[<Normal page] [**PEREZGONZALEZ Jose D (2011)**. *Nutritional evolution of chocolate bars*. Journal of Knowledge Advancement & Integration ([ISSN 1177-4576](#)), 2011, pages 28-31.]

Nutritional evolution of chocolate bars

The nutritional composition of chocolate snack bars in New Zealand and Australia has remained unchanged in the four years between 2007 and 2011, according to a research done by Pérezgonzález (2011a²). That is, although individual chocolate bars may have changed slightly in nutritional composition, the average chocolate bar in 2007 and the average chocolate bar in 2011 are practically the same.

Using a sample of 15 chocolate snack bars of the same brand and make for both periods, Pérezgonzález found no significant differences in either the nutritional composition of the snack bars or their overall nutritional balance (see *Illustration 1*). The average nutritional balance was BNI 124.05s in 2007 and BNI 123.53s in 2011, hardly any change at all.

Results were also very similar for individual macronutrients, which showed that an average chocolate bar is extremely low in protein and fiber, and extremely high in sugars, fat and saturated fat; on the positive side, it is also extremely low in sodium (see *profile in Illustration 2*).

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Illustration 1: Nutrition information (average snack bar)

BNI	123.53s	124.05s	0.00
Food, 100g	2011	2007	Ideal
Protein	6.1	6.1	24.7
Carbohydrate	61.3	61.7	67.9
Sugars	52.3	52.5	< 12.3
Fat	24.9	24.7	13.7
Saturated fat	14.8	14.9	< 5.5
Fiber	0.0	0.0	7.4
Sodium	0.114	0.113	< 0.493
Kcal	493.5	493.5	493.5
kJul	2064.9	2064.7	2064.7

Illustration 2: Nutritional profile (average)

55%					
50%	*				
45%	*	*			
40%	*	*			
35%	*	*			
30%	*	*			
25%	*	*			
20%	*	*			
15%	*	*			
10%	*	*			
5%	*	*	*		
mid	p	c	f	fb	
max		s	sf		na
5%		*	*		*
10%		*	*		
15%		*	*		
20%		*	*		
25%		*	*		
30%		*			
35%		*			

40%

*

ideal % = darker cells; actual % = asterisk (*)

International standards

Individual chocolate snack bars may have changed slightly in nutritional composition and, thus, nutritional balance, but while some snack bars may have become slightly more balanced, others have become equally more unbalanced, resulting in a similar average for both years. Illustration 3 shows small changes in nutritional balance along the years and across different international [Recommended Dietary Intakes \(RDIs\)](#). It also shows that these nutritional indexes are high and relatively similar to each other, indicating that the nutritional composition of chocolate snack bars would be deemed equally unbalanced in different countries.

Illustration 3: Nutritional balance across different RDIs (average snack bar)							
Food	Company	Year	BNI	WHO	US/CAN	AUS/NZ	UK
Aero	Nestle	2011	134.79	134.79	104.79	134.79	130.79
(Aero Temptations caramel)		2007	135.91	135.91	105.91	135.91	131.91
Dairy Milk	Cadbury	2011	133.51	133.51	103.51	133.51	129.51
		2007	132.44	132.44	102.39	132.39	128.39
Dairy Milk caramello	Cadbury	2011	130.04	130.04	100.04	130.04	126.04
		2007	124.68	124.68	94.68	124.68	120.68
Dairy Milk fruit & nut	Cadbury	2011	130.13	130.13	93.51	123.51	119.51
		2007	127.29	127.29	91.74	121.74	117.74
Flake	Cadbury	2011	134.42	134.42	104.42	134.42	130.42
		2007	134.37	134.37	104.37	134.37	130.37
KitKat	Nestle	2011	128.16	128.16	98.16	128.16	124.16
		2007	124.51	124.51	94.51	124.51	120.51
Mars	Mars	2011	124.31	124.31	94.31	124.31	120.31
		2007	132.28	132.28	102.28	132.28	128.28
Milkybar	Nestle	2011	137.11	137.11	107.06	137.06	133.06
		2007	136.98	136.98	104.03	134.03	130.03
Moro Gold	Cadbury	2011	129.76	129.76	99.76	129.76	125.76
		2007	123.40	123.40	93.40	123.40	119.40
Perky Nana	Cadbury	2011	102.96	102.96	72.96	102.96	98.96
		2007	119.83	119.83	89.83	119.83	115.83
Picnic	Cadbury	2011	115.94	115.94	75.94	105.94	103.94
		2007	111.55	111.55	71.55	101.55	99.55
Pinky	Cadbury	2011	129.97	129.97	99.97	129.97	125.97
		2007	130.12	130.12	100.12	130.12	126.12

Pixie caramel	Nestle	2011	139.13	139.13	109.13	139.13	135.13
		2007	135.11	135.11	105.11	135.11	131.11
Snickers	Mars	2011	116.58	116.58	76.58	106.58	104.58
(Snickers Maximus)		2007	122.60	122.60	82.60	112.60	110.60
Twix	Mars	2011	112.30	112.30	82.30	112.30	108.30
		2007	118.46	118.46	88.46	118.46	114.46

Furthermore, the correlations between the results obtained using the BNI™ RDIs and those of other nutritional standards were also very high and significantly so. This suggests that the nutritional balance reported by the BNI™ index matches that of other national standards. (Said otherwise, that chocolate snack bars tend to form a similar hierarchy when indexed using different international standards).

Illustration 4: Correlations between RDIs				
	BNI	WHO	US/CAN	AUS/NZ
WHO	1.000			
(sig.)	.000			
US/CAN	.950	.950		
(sig.)	.000	.000		
AUS/NZ	.950	.950	1.000	
(sig.)	.000	.000	.000	
UK	.962	.962	.999	.999
(sig.)	.000	.000	.000	.000

Methods

Sample

- 15 chocolate bars and candy bars normally sold as snack bars around New Zealand (yet all bars were made in Australia and, thus, can be assumed they were equally available there).
- All bars but two were similar in make and branding in both years. The two bars that differed were 'Snickers Maximus' in 2007, which got substituted with 'Snickers' in 2011, and 'Aero Temptations caramel' in 2007, which got substituted with 'Aero' in 2011.
- The sampling selection was conditioned by decisions made back in 2007 regarding a similar research on a larger sample of snack bars (see Pérezgonzález, 2007¹). Thus, the sample should be considered a convenient one, kept similar to that in 2007 for the purpose of a more accurate comparison between the same snack bars.

Materials & analysis

- The nutrition information for each bar was retrieved from the nutritional information panel at the back of the bar, and analyzed using the [Balance Nutrition Index™ \(BNI™\)](#) technology (see Pérezgonzález, 2011b³).
- SPSS-v16 was used for statistical analysis, which included descriptives, t-tests for independent samples, and correlations.

References

1. **PEREZGONZALEZ Jose D (2007)**. [Snack bars in New Zealand](#). The Balanced Nutrition Index (ISSN 1177-8849), 2007, issue 2.
2. **PEREZGONZALEZ Jose D (2011a)**. [Chocolate bars nutritional balance: 2007-2011](#). The Balanced Nutrition Index (ISSN 1177-8849), 2011.
3. **PEREZGONZALEZ Jose D (2011b)**. [Balanced Nutrition Index™ \(BNI™\)](#). Journal of Knowledge Advancement & Integration (ISSN 1177-4576), 2011, pages 20-21. Also retrievable from [Wiki of Science](#).

Want to know more?

[BNI™ database](#)

The database offers individual nutrition analysis for foods, including the snack bars in the sample as well as the average 'chocolate bars' for both years found in this research.

[BNI™ journal - 2011](#)

This issue of the Balanced Nutrition Index™ journal collates all BNI™ nutrition information for the snacks in the sample as well as average 'chocolate bars' in a single book.

[Wiki of Science - Balance Nutrition Index™ \(BNI™\)](#)

This Wiki of Science page offers more information about the BNI™ technology.

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