



Product Nutritional Evaluation Report

Wholesale Group International Pty Ltd

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Product: Biltong (100g) [Manufacturer: Protea Foods Pty. Ltd.]

Nutrient	Units	RDI ^c	'beef jerky' ^d Per 100 g	BJ per 100g ^b	% RDI	Biltong Per 100g	% RDI	Difference ^c (%)
Water	g	3400	23.36	-	0.7%	25.7	0.8%	+10.0%
Energy	kJ	10700 ^a	1715	1557	16.0%	1162	10.9%	-25.4%
Protein	g	52	33.2	30.15	63.8%	58.9	113.3%	+177%
Total lipid (fat)	g	n/a	25.6	23.24	n/a	2	n/a	-1280%
Total lipid (fat) unsaturated	g	n/a	10.85	9.85	n/a	0.7	n/a	
Carbohydrate	g	n/a	11	9.98	n/a	5.2	n/a	-51%
Sugars, total	g	n/a	9	8.17	n/a	4.1	n/a	-54%

a. Energy data assumes a 31 – 40 yr old man, 1.7cm in height and a physical activity level (PAL) of 1.6, and protein intake of /day (0.68 g/kg), assuming a BMI of 22. (Aust. Gov't. 2005)

b. Nutritional Values for 'beef jerky' once the difference in water content between 'beef jerky' and Biltong was standardized.

c. Difference (%) – the percentage difference in nutritional values between the Protea Foods Biltong and 'beef jerky'.

d. "beef jerky", as defined by the USDA (please see reference section for exact location of nutritional data).



Key Findings:

Protea Foods Biltong product is clearly superior to 'beef jerky' products from a health/dietary perspective.

Firstly, it is a moister, chewier product (10% more moisture) which aids in digestion. Further, Biltong contains 92 less calories (395 kJ) per 100g. Increased energy intake without corresponding energy expenditure is a key contributor to the development of a higher body weight and diseases such as obesity (Laddu *et. al.* 2011), insulin resistance leading to diabetes and fatty liver disease (Straznicky *et. al.* 2011).

This reduced energy content is mainly due to the reduced fat of Protea Foods Biltong. The 'beef jerky' under examination consists of 25.6% fat (of which 58% is saturated fat), with Protea Foods Biltong a mere 2% fat. The high saturated fat content of 'beef jerky' and the consumption of saturated fat is linked to the risk of development of abdominal obesity via certain genes that control adipocyte (fat cells) development, and important in glucose homeostasis and metabolic syndrome (i.e. STAT3 polymorphisms (rs8069645, rs744166, rs2306580, rs2293152, and rs10530050) (i.e. saturated fat intake has gene-nutrient interactions) (Phillips *et. al.* 2009). Further, the consumption of saturated fats has been linked to a number of other diseases, especially congestive heart failure and elevation of systemic inflammation (i.e. IL-6 and TNF- α) (Lennie *et. al.* 2005).

Lastly, the consuming the substantially high protein content, as found in Protea Foods Biltong (+177%) in comparison with 'beef jerky' with combination with its low fat content (2%) and low carbohydrate content (-51% of 'beef jerky') may decrease the risk of developing the metabolic syndrome and type 2 diabetes (Te Morenga *et. al.* 2011). Eating a high protein diet (30% protein, 40% carbohydrate) with a reduction in energy intake (2000 - 4000 kJ per day), may lead to a weight loss of -4.5 kg and reduced total body fat -4.0 kg, and reduction in waist circumference (-5.4 cm), total and LDL cholesterol, triglycerides, fasting plasma glucose and blood pressure over an 8 week period (Te Morenga *et. al.* 2011).

In conclusion, we recommend the consumption of Protea Foods Biltong in favor of 'beef jerky' as it contains very little fat, half the carbohydrates, more protein and has a more moist, chewier taste which will assist with digestion of the product.



Reference

Australian Government. Department of Health and Aging. NHMRC. (2005). 'Nutrient Reference Values for Australia and New Zealand Including Recommended Dietary Intakes'.

Laddu D., Dow C., Hingle M., Thomson C., Going S. (2011). 'A review of evidence-based strategies to treat obesity in adults'. *Nutr Clin Pract.* **26(5)**, 512-25.

Lennie T.A., Chung M.L., Habash D.L., Moser D.K. (2005). 'Dietary fat intake and proinflammatory cytokine levels in patients with heart failure'. *J Card Fail.* **11(8)**, 613-8.

Phillips C.M., Goumidi L, Bertrais S, Field MR, Peloso GM, Shen J, McManus R, Hercberg S, Lairon D, Planells R, Roche HM. (2009). 'Dietary saturated fat modulates the association between STAT3 polymorphisms and abdominal obesity in adults'. *J Nutr.* **139(11)**, 2011-7.

Straznicky N.E., Lambert EA, Grima MT, Eikelis N, Nestel PJ, Dawood T, Schlaich MP, Masuo K, Chopra R, Sari CI, Dixon JB, Tilbrook AJ, Lambert GW. (2011). 'The effects of dietary weight loss with or without exercise training on liver enzymes in obese metabolic syndrome subjects'. *Diabetes Obes Metab.* Sep 17

Te Morenga LA, Levers MT, Williams SM, Brown RC, Mann J. (2011). 'Comparison of high protein and high fiber weight-loss diets in women with risk factors for the metabolic syndrome: a randomized trial'. *Nutr. J.* **10**, 40.

USDA (United States of America Department of Agriculture) Nutrient Database
[\[http://www.nal.usda.gov/fnic/foodcomp/cgi-bin/list_nut_edit.pl\]](http://www.nal.usda.gov/fnic/foodcomp/cgi-bin/list_nut_edit.pl)

Appendices and other details:

Protea Foods Pty Ltd - <http://www.proteafoods.com/>

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