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Oat fibre and chilli promote satiety synergistically

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According to the World Health Organization (WHO), obesity has become a global health problem. Approximately 2 billion adults were overweight and over 650 million of these were classified obese in 2016⁽¹⁾. Ready access to energy-dense, highly palatable food contributes to an obesogenic environment⁽²⁾. The demand for food consumption is not just driven by a need for energy but also by the pleasure of eating the food itself⁽³⁾. In order to control obesity, foods that increase satiation and satiety may be beneficial to reduce food intake⁽⁴⁾. Noodles served in a spicy broth are the basis of many Asian dishes. Capsaicin, the major pungent substance in chilli peppers, and oat fibre have been shown to increase satiety^(5,6). This study aimed to test the hypothesis that oat fibre and chilli may interact to affect satiety in humans.

The satiety study was a randomised crossover design with 12 untrained volunteers (ethical reference number University of Leeds MEEC 16–040). The fasted subjects consumed a noodle soup breakfast meal (125 g cooked noodle in 200 ml clear broth) with 3 different levels of fibre in the noodle (0, 10, 20 % w/w of oat fibre (BG28, Swedish Oat Fibre) in strong wheat flour) and 2 levels of chilli (0 and 1 % w/v) in the broth over 6 breakfast sessions. Satiety was measured immediately pre- and post- consumption of the noodle meal with a 7-category intensity scale (none to strongest imaginable), measuring five attributes (hunger, fullness, desire to eat more food, desire to eat the next meal and willingness to eat). Results were analysed using a linear mixed model repeated measures ANOVA and Cohen's d for effects size.

Table 1. Comparisons of the mean estimates for the difference after and before the meal between the control condition (no added fibre and no chilli) and different experimental conditions for hunger and fullness attributes

Fibre	Chilli	Hunger				Fullness			
		Diff	Effect size (d)	p-value	95 % CI	Diff	Effect size (d)	p-value	95 % CI
None	Present	-0.17	-0.40	0.35	[-1.25,0.46]	-0.42	-1.08	0.02	[-1.98,0.17]
10 %	None	0.25	0.60	0.17	[-0.27,1.46]	0.67	1.72	<0.01	[0.73,2.72]
10 %	Present	-0.08	-0.20	0.63	[-1.05,0.65]	-0.08	-0.22	0.60	[-1.06,0.63]
20 %	None	0.50	1.19	0.01	[0.27,2.11]	0.33	0.86	0.06	[-0.02,1.75]
20 %	Present	0.83	1.99	<0.01	[0.95,3.02]	0.67	1.72	<0.01	[0.73,2.72]

Hunger levels for all conditions decreased and fullness levels increased significantly after meal consumption. The addition of chilli to the 20 % fibre noodles had the most significant effect on hunger and fullness followed by 20 % fibre noodle without chilli. Chilli had no effect on hunger and fullness at 10 % fibre, but seem to reduce fullness at 0 % fibre. In conclusion, fibre and chilli appear to affect satiety synergistically at higher fibre levels. Future work will focus on determining the optimal level of fibre and capsaicin that can contribute to higher satiety effect and to investigate effects over longer post-meal periods.

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