

Effect of microwaves on the metabolizable energy of green pea (*Pisum sativum*)

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Introduction

The feeding cost represents between 55 and 70% of the production costs of chicken meat or eggs. Corn and soybeans showed a price increase of 88 and 57% in the last 24 months, respectively. This price increase motivates the need to look for alternative ingredients in order to lower costs. The green pea (*Pisum sativum*) is presented as a viable alternative. Peas are an ingredient with good potential for animal feed, having a high crude protein content (20-26%), good palatability and low content of anti-nutritional factors. The use of microwaves is not a new technology, however, it is little exploited.

Objective

The aim of this trial was to evaluate the effect of microwaves on the metabolizable energy of green peas.

Material & Methods

A sample of 200 g of raw green peas was placed on the plate of a 900-watt home microwave and cooked at 70% power for 0, 3, 5, 6, 7, and 9 min, using a completely randomized design with 6 treatments and 3 repetitions each. Moisture (M), crude protein (CP), ureasic activity (UA), protein solubility (PS), acid detergent insoluble nitrogen (ADIN), true metabolizable energy (TME) and coefficient of utilization of gross energy (TME/GE) were determined. The data were subjected to analysis of variance (ANOVA), when the degree of significance was less than 5%, the comparison of means was performed by the test of minimal significant differences; also lineal regression was used to determine lineal or quadratic effect.

Table 1. Effect of deactivating green pea with microwave on chemical parameters

Cooking time (min)	M %	CP* %	UA ΔpH	PS %	ADIN %
0	11.26 ^a	24.05	0.06 ^a	71.77 ^a	2.19 ^b
3	9.38 ^b	22.56	0.04 ^b	66.00 ^a	3.74 ^b
5	7.46 ^c	23.67	0.03 ^{bc}	55.62 ^b	3.23 ^b
6	5.86 ^d	25.03	0.02 ^{cd}	43.80 ^c	3.39 ^b
7	4.99 ^e	25.10	0.02 ^{cd}	35.94 ^d	4.93 ^b
9	3.61 ^f	24.72	0.01 ^d	24.01 ^e	12.76 ^a
Probability	<0.01	0.16	<0.01	<0.01	<0.01
Lineal effect	<0.01	0.49	<0.01	<0.01	<0.01
Quadratic effect	0.31	0.33	0.24	<0.01	<0.01
CV (%)	0.4	3.9	26.8	8.2	38.0

*Data standardized at 12% of moisture. M: Moisture; CP: Crude protein; UA: Ureasic activity; PS: Protein solubility in KOH 0.2%; ADIN: Acid detergent insoluble nitrogen.

Mean with different superscript differ statistically (ps0.05).

Results

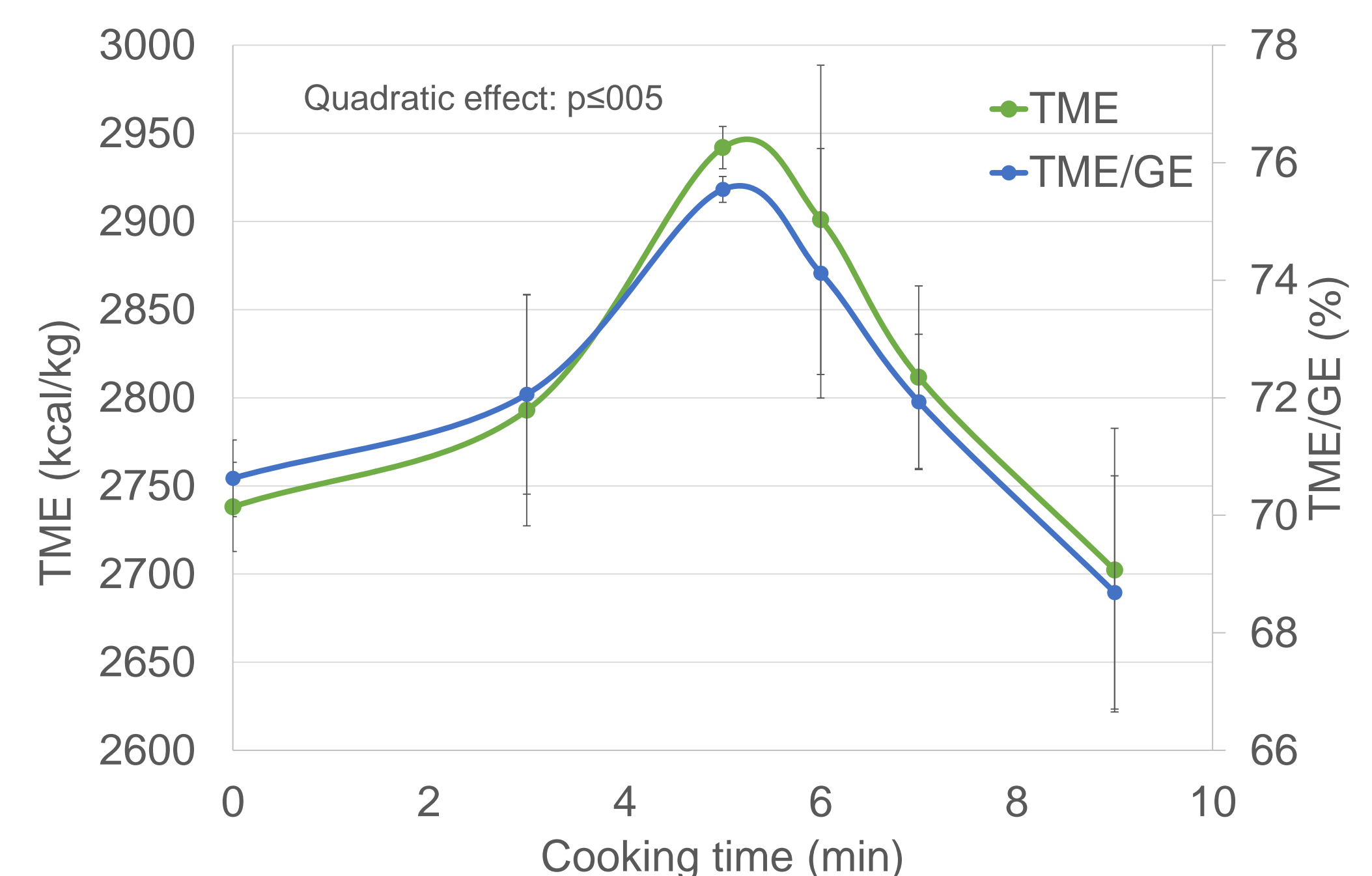


Figure 1. True metabolizable energy and energy utilization of green pea cooked at different times.

Conclusions

Despite the fact that peas have low levels of anti-nutritional factors, a beneficial effect was found when applying a thermal process using microwaves, and it was established that the best results of TME and TME/GE are achieved with 5 min of cooking at 70% power in a 900-watt home microwave.

