

Pork meat balls rich in fibres as satiety enhancing food products (a randomized cross-over study)

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INTRODUCTION

In the context of the still rising obesity epidemic, the development of foods that are rich in dietary fibres and have a high protein content is beneficial when targeting appetite control.

OBJECTIVES

This study describes protein-dietary fibre interaction and determines how appetite and energy intake were affected by

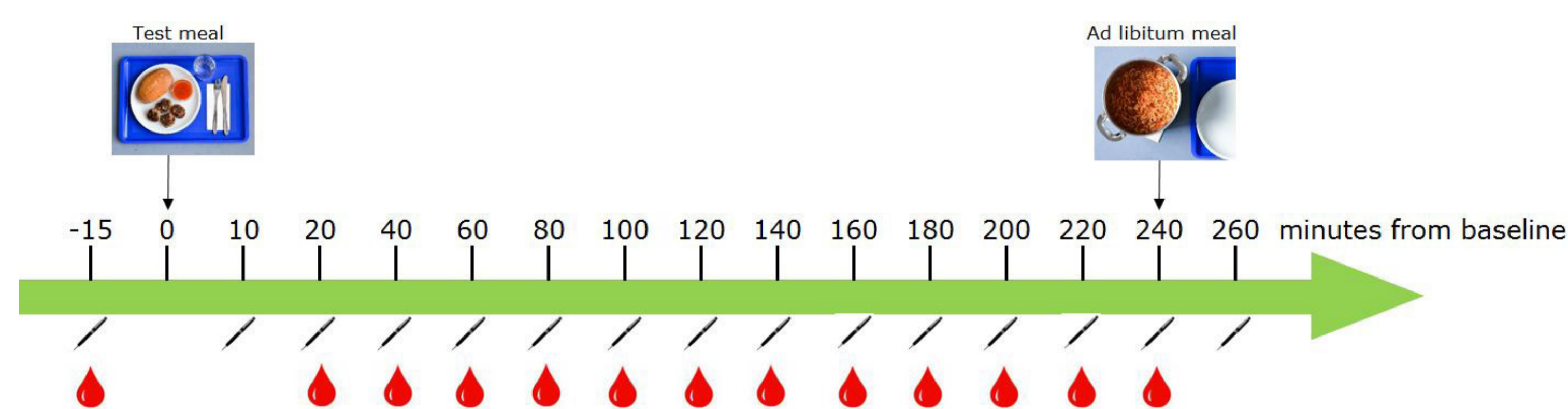
- The addition of fibres to meat balls
- The protein source (animal vs. vegetable protein)
- The food vehicle of the dietary fibre (fibre meat balls vs. fibre bread)

STUDY DESIGN

In a cross-over study, 40 healthy normal-weight men were served four test meals:

- NoFiber meal: meat balls + wheat bread
- BreadFiber meal: meat balls + fibre bread
- MeatFiber meal: meat balls w/fibre + wheat bread
- VegFiber meal: vegetable meat balls having a natural fibre content + wheat bread

Ad libitum energy intake after 4 hours was the primary endpoint. Furthermore, subjective appetite sensations (hunger, satiety, fullness and prospective food intake), glucose and insulin were assessed during the 4 hours.



NUTRITIONAL COMPOSITION OF THE TEST MEALS

	NOFIBRE	BREADFIBRE	MEATFIBRE	VEGFIBRE
Energy (kJ)	3049	3033	3033	3041
Weight (g)	342	345	342	344
Density (kJ/g)	8.9	8.8	8.9	8.8
Protein (E%)	18.1	18.4	18.3	17.8
Fat (E%)	31.7	32	31.4	29.6
Carbohydrate (E%)	50.2	49.7	50.3	52.6
Dietary fibre (g)	5	12.6	12.7	12.6

RESULTS

- The addition of dietary fibre to meat balls improved subjective appetite sensations. Also, the MeatFiber meal tended to decrease energy intake and the 2 hour glucose and insulin response.
- The satiating effect seemed to be more pronounced when fibre was added to meat balls compared to when added to bread.
- No differences were seen between the animal and the vegetable protein based meals.

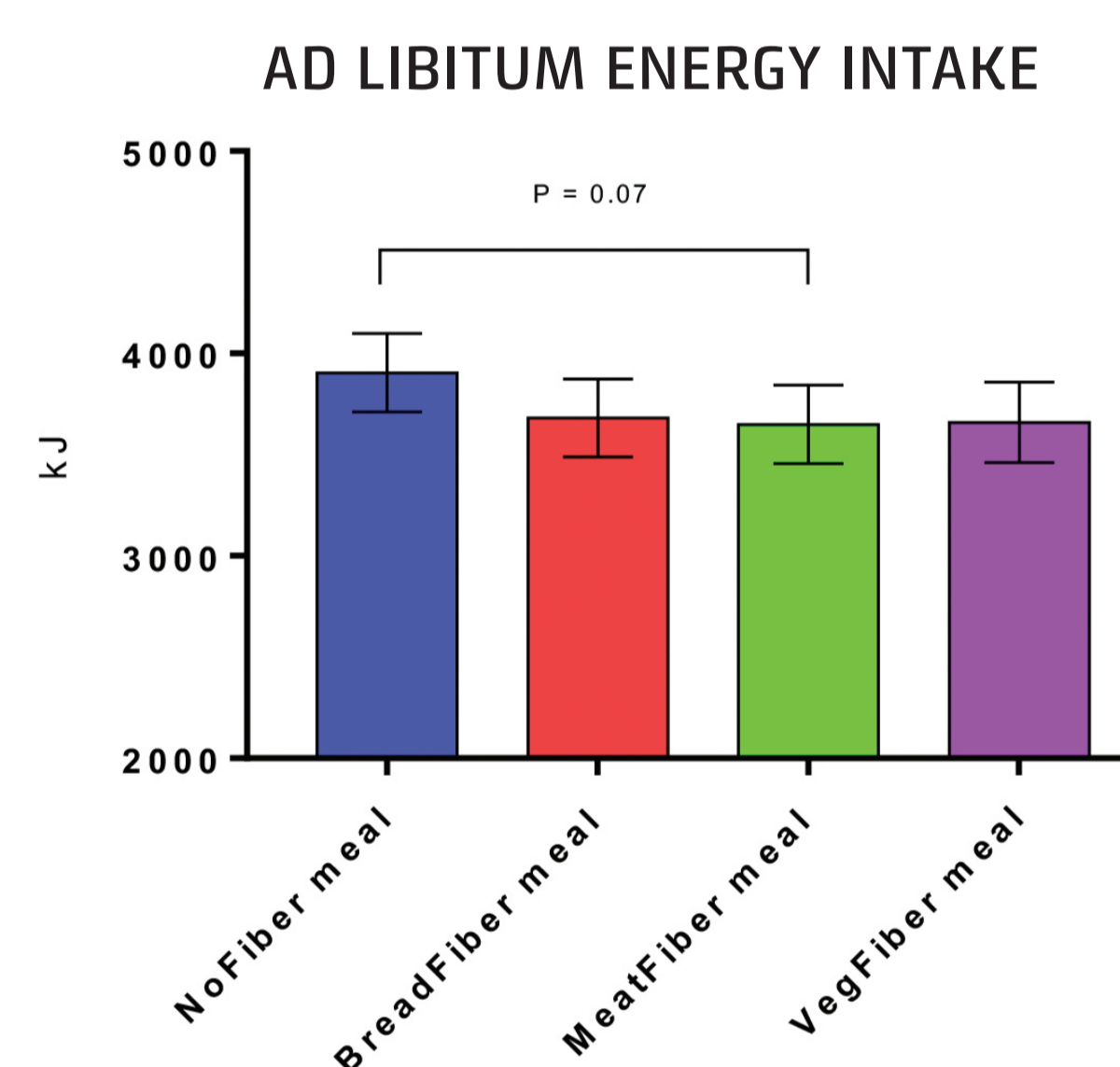


Fig.1. Ad libitum energy intake after 4 hours presented as $I_{\text{means}} \pm \text{SEM}$ (n=40). Data was analysed using a mixed-model ANCOVA followed by Tukey-Kramer adjustment.

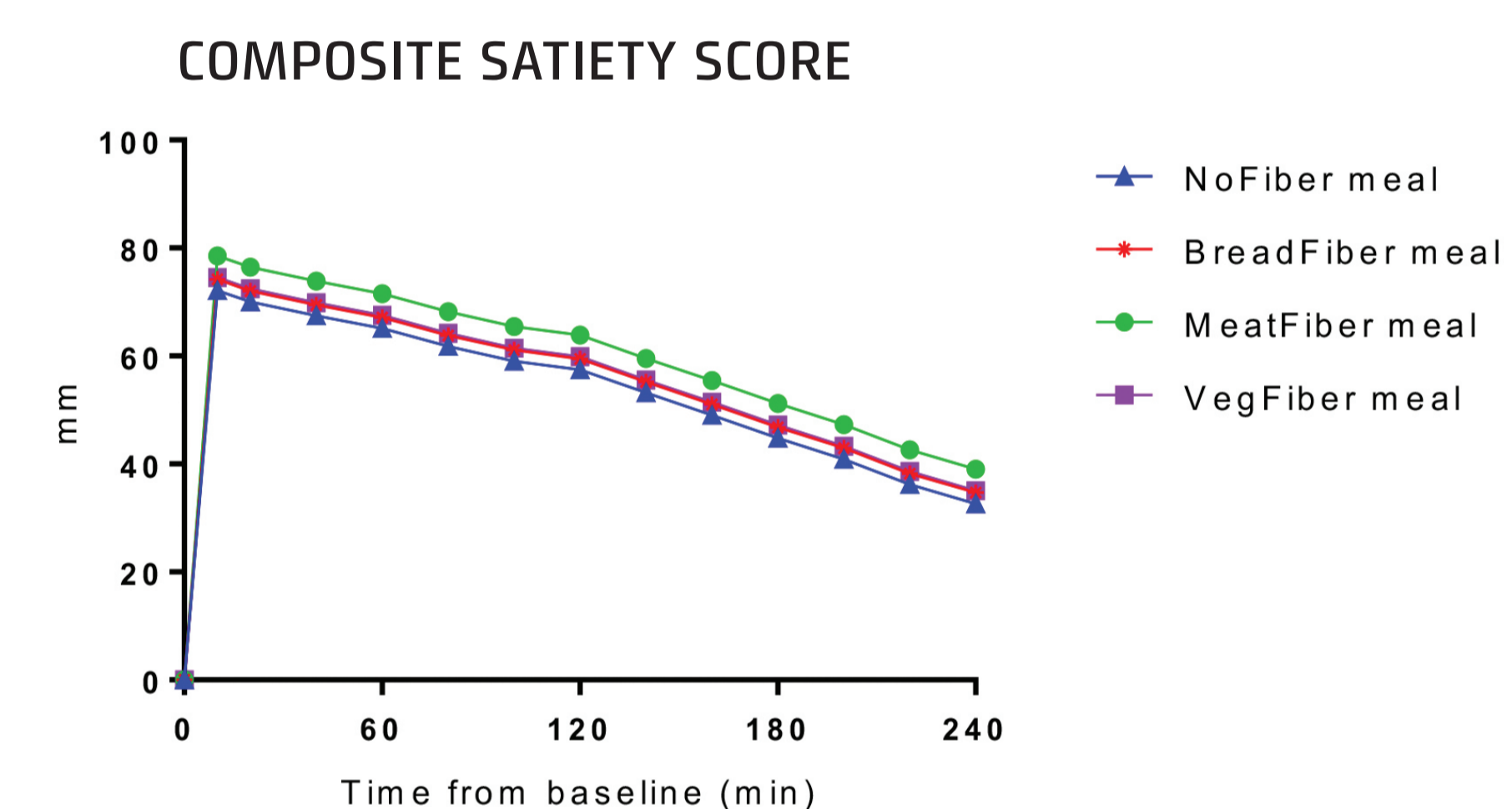


Fig.2. Composite satiety score (CSS) calculated for each time point: $(\text{satiety} + \text{fullness} + (100 - \text{prospective food intake}) + (100 - \text{hunger}))/4$. Data is presented as I_{means} (n=40). Data was analysed as repeated measurements by using a mixed-model ANCOVA followed by Tukey-Kramer adjustment.

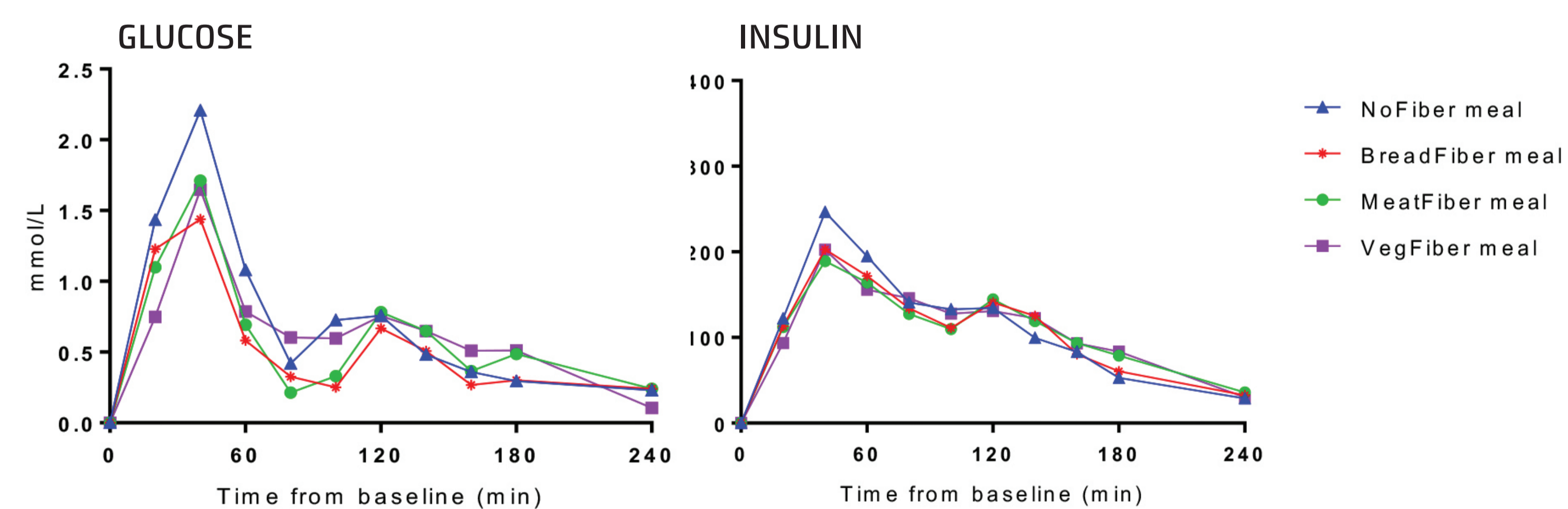


Fig.3. Mean 4-hour glucose and insulin responses (n=13). Data was analysed as repeated measurements by using a mixed-model ANCOVA followed by Tukey-Kramer adjustment.

CONCLUSION

In conclusion, meat products with fibres could be used as satiety-enhancing foods targeting consumers who want to maintain or lose body weight.



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