
INTRODUCTION

Obesity is a significant risk factor for lifestyle-related diseases, including cardiovascular disease, type 2 diabetes and certain cancers¹⁻³. These comorbidities of obesity are associated with increased risk of mortality, thus making prevention of overweight and obesity an important target. In Denmark, the prevalence of overweight (BMI \geq 25 kg/m²) and obesity (BMI \geq 30 kg/m²) among the adult population is 47% and 13%, respectively⁴, whereas the prevalence of being either obese or overweight among American men and women is 71% and 62%, respectively⁵.

Lifestyle factors such as physical inactivity and energy-dense diets are important contributors to obesity and its related diseases. In today's obesogenic environment, energy-dense foods high in fats, sugar and salts and low in fiber content are widely available and heavily promoted. Such foods are often relatively cheap and highly palatable, which easily leads to overconsumption. Thus, there is a need for healthier food products that are low in fat, affordable and palatable to replace unhealthier products⁶. In this context, tailored food products that have a greater impact on appetite control could be an efficient tool in obesity prevention. Numerous randomized controlled trials report a beneficial effect of diets high in protein on short-term appetite, weight loss and weight maintenance after weight loss⁷⁻¹⁰. Also, dietary fiber has been suggested to enhance satiety^{11,12}. A combination of dietary fiber and protein could therefore be beneficial in the formulation of satiety-enhancing foods.

Denmark is one of the world's leading exporters of pig meat. Approximately 18 million pigs are slaughtered annually¹³, making the meat industry an important asset in terms of employment and trade. Although pork is an important source of dietary proteins, some pork products are also characterized as high-fat products containing more than 10 g fat per 100 g. In this context, the Danish meat industry puts a lot of effort into developing meat products with a healthier nutritional profile. Thus, it is relevant to provide scientific evidence on the satiating effects of new formulations of pork products.

Different strategies can be applied to potentially enhance the satiating properties of pork. Processed meat products such as meatballs consisting of minced meat can serve as a matrix for the addition of fiber ingredients. Based on their high protein and fiber contents, fiber-rich meatballs could provide a dual mechanistic action that would lead to greater satiety. For cuts of meat or whole muscles, cooking is known to induce structural, physical and chemical changes of the meat proteins¹⁴, which in turn may affect protein digestibility¹⁵. Evidence from milk proteins suggests that differences in

protein digestibility and absorption lead to different satiety responses¹⁶. The extent to which differences in meat protein digestibility following cooking affect satiety has not yet been examined.

The overall aim of this PhD thesis, therefore, was to investigate the effects of fiber addition to meatballs and the effects of cooking methods of pork on appetite regulation.

Thesis delimitations

The background section of this PhD thesis is delimited to focusing on physiological aspects of appetite regulation whereas psychological, social and cultural factors are beyond the scope of this thesis. Moreover, the role of colonic fermentation of dietary fiber in appetite regulation is beyond the scope of this thesis.

The literature in the background section was reviewed in depth covering the evidence thoroughly, however, the literature review was not performed systematically according to the PRISMA guidelines.