SUMMARY

Roux-en-Y gastric bypass (RYGB) and sleeve gastrectomy (SG) surgery lead to a substantial decrease in energy intake and subsequent weight loss. It is unclear, whether this decrease in energy intake is simply due to eating smaller portions of the same food items or a shift in food preference and choices towards less energy-dense foods. Changes in food preferences have been reported; however, the evidence is based on indirect measurements such as food records, questionnaires, and interviews, which are prone to inaccuracy. The mechanisms driving changes in food preferences are yet to be fully elucidated. It has been suggested, that changes in taste perception as well as learning processes related to postprandial discomfort following intake of fatty and sugary foods can lead to a shift in food preferences toward more healthy food choices.

The overall aim of this thesis was to investigate changes in food preferences after RYGB and SG surgery and the underlying mechanisms involved. Using an *ad libitum* buffet meal test targeting direct behaviour changes in food preferences were assessed before, and 6, and 18 months after RYGB and SG surgery. Furthermore, we assessed food preferences using a picture display test to explore potential differences between a method relying on verbal report and a method assessing direct behaviour. To investigate potential mechanisms behind changes in food preferences, sweet taste sensitivity and the hedonic evaluation of sweet, savoury and fatty food stimuli were assessed before and 6 weeks, 6 months and 18 months after RYGB and SG surgery. Also, we evaluated the experience with unpleasant physiological responses to food consumption after surgery as a potential mechanism for changes in food preferences. In a subsample, we also investigated the effect of RYGB and SG surgery on food reward using functional magnetic resonance imaging (fMRI).

No shift in food preferences were found at the buffet meal test since we found no changes in relative intake of high-fat, low-fat, sweet, or savoury foods, and no changes in macronutrient intake or energy density 6 and 18 months after RYGB and SG surgery. In contrast, preference for low-fat savoury foods was increased at the picture display test 6 months after surgery. Interestingly, increases in relative intake of protein and decreases in relative intake of high-fat foods and energy density were found to predict percentages of total weight loss (%TWL) at 18 months. A decline in liking for high-fat food stimuli was found in the early postoperative period, and this decrease persisted throughout the 18 months follow-up period. However, the decreased liking for the high-fat food stimulus was not associated with intake of high-fat food at the buffet meal, nor was the experience of unpleasant physiological responses to food associated with intake of high-fat and sweet foods, even though the majority of the included subjects reported some degree of postprandial discomfort after surgery. No changes in sweet taste sensitivity or hedonic rating of sweet and savoury food stimuli were found after RYGB and SG surgery. Whether RYGB and SG surgery affects food reward at a neural level was not possible to conclude from our fMRI data due to data uncertainty caused by excessive head movement.

This is the first study to investigate changes in food preferences following bariatric surgery using direct measures of behaviour. Findings from the buffet meal test do not support the hypothesis that a decline in energy intake after RYGB and SG surgery is caused by a shift in food preferences towards less energy-dense foods. These results underline the necessity of including methods targeting direct behaviours and not exclusively rely on verbal report measures when investigating complex behaviour. However, even though we found no consistent changes in food preferences for the entire cohort, there seems to be a sub-group of individuals that experience a shift in preferences, which contributes to a more successful weight loss.