Appendix 1. Literature review conducted by MBF highlighting the impact of aging on the enjoyment of food and the consequences on consumption and ultimately malnutrition

Age and Taste, Literature Review Key Points

- Malnutrition is recognised health risk in older age [1].
- Clinical factors include: swallowing disorders, depression (affecting the motivation to eat), medication, dentition, dementia, gastrointestinal health and the impact of disease [6-11]. Of the latter a further and often under-recognised factor, but a problem often cited by older people in residential aged care is that food lacks taste [12].
- Taste acuity is known to be affected by salivary flow, odour perception, chemoreceptor sensitivity, oral health, dentition, mastication and oral texture perception, and a variety of medications [11].
- Given its importance for appetite, strategies that promoting taste in residential aged care offer potential gains in health and life satisfaction.
- Taste sensitivity is well known to be diminished in older adults [42-44], especially older adults in acute care settings [45].
- There are a number of possible explanations underlying blunted taste sensitivity in older adults. A major factor is thought to be the age-related reduction in taste bud density.
- Another potential explanation for blunted taste sensitivity in older adults is the age-related changes in saliva. Aging is associated with a reduction in the secretory reserve capacity of salivary glands, reduced salivary flow rates (especially post menopausal women [57].
- Interestingly, some of the effects of the age-related change in taste perception may be reversible. Shiffman et al [52] discuss various techniques for improving salivary health including flavour intensification and strategies to stimulate smell and taste with positive effects on appetite.
- In addition to the age-related decline in taste sensitivity in the elderly, various drugs commonly prescribed to this population have the potential to affect gustatory function.
- Food plays a profound role in one’s life. The ability to choose what, when to eat as well as the eating environment all influence the pleasure associated with eating.
- We have anticipatory sensory and cognitive reactions to foods (e.g., how pleasurable we think consumption will be, other associations with the food) [92]. In this way, our preferences are strongly linked with lifetime experiences and traditions and removing the ability to decide on foods to eat can impact on overall quality-of-life [93]. The familiarity of foods that taste like home and remind them of their ethnic identity has been reported as being important [94]. These factors remain important as we age, yet in residential aged care settings these factors can be a challenge to manage [95].
- Yet, it is important to recognise that food choice is strongly linked with resident food service satisfaction [99]. Mealtimes represent more than just an chance to provide nutrition; they may offer residents (and staff) the opportunity to develop important social relationships [100]. Furthermore, the environment that residents eat in will also impact on satisfaction associated with the food service [94].
- These are critical concerns in the context of the well-documented phenomenon referred to as the “anorexia of aging” [92, 101].
In addition, as we age, our food perception and enjoyment is also influenced by changes in dental health, sensory changes (reductions in vision, taste, and smell), and changes in gut function.

Perceptions of taste appear to be one of the main factors influencing energy intake in older adults [103, 104]. Therefore, when considering food provision for elderly people, especially in the context of aged care, it is important to go beyond a focus on nutrients to include consideration of food delivery. This includes thought regarding the types of foods offered, as well as the environmental, social, and sensory experience.

Detection thresholds in older adults for basic tastes such as sweeteners, salt, acids, and bitter compounds, have been found to be 4 to 5 times higher than in comparison to younger adults [107]. This reduction in their ability to detect flavours in food may lead to a bland food experience and to a move toward an increase in discretionary foods with more intense flavours.

Also refer to:
Incorporating natural ingredients rich in umami taste or intense flavour ingredients (such as tomatoes, sharp-aged cheese, shiitake mushrooms, soy and garlic, onion, concentrated fruit sauce or flavoured oils/vinegars, or spices with bolder aromas, that is, basil, chives, coriander, and sage rosemary) could also assist with enhancing appetite and pleasure associated with food consumption [105].

Presenting small portion sizes, in particular, when the foods presented are high in energy density, results in increased energy intake in older adults [92].

A supportive environment can provide a sense of familiarity, comfort, security, enjoyment, belonging and identity [133] and contribute to overall nutrition status by encouraging food consumption [134, 135].

To conclude, in this review we examined the age-related change in taste and, as well, strategies reported to enhance taste including food type, flavour perception, and the eating environment. Despite the gaps in our knowledge, we suggest that there exists sufficient evidence that taste can be enhanced in older adults and, thereby, appetite. The remaining challenge is how to promote best practice.