CHAPTER 6
CONCLUSION

Despite several efforts to improve nutritional status, IDA remains a debilitating micronutrient deficiency worldwide. Based on the available information in the literature, date palm and goat milk are rich with numerous bioactive and functional compounds that not only provide an appreciable amount of energy but also possess promising therapeutic potential against several illnesses explored under *in-vitro* and *in-vivo* conditions. This study demonstrated that the consumption of date palm and goat milk has a remarkable effect in improving IDA. Date palm is rich in glucose and fructose making it a natural energy-rich food. It also contains calcium, magnesium, iron, manganese, zinc and ascorbic acid. Goat milk contains lactose, iron, zinc, calcium and magnesium. Intervention of date palm and goat milk not only increase the body weight of rat following low iron diet, but also significantly increase the Hb level and serum iron level, approaching the normal value. Significant improvement was also seen in other indices of iron deficiency such as RBC, PCV and transferrin saturation level. Iron bioavailability was also normalised following intervention with date palm and goat milk. During iron deficiency, the expression of iron metabolism gene such as Dcytb, ferroportin, transferrin and TfR were significantly up-regulated to compensate for low iron condition, which in turn promote iron import and erythropoiesis. The intervention with date palm and goat milk helps to normalise the expression of those genes. The outcomes of this study give insight into the potential utilisation of date palm and goat milk for the nourishment of overall wellbeing, as well as expanding the database of information within the field of functional food.

Limitation and further recommendation

Although animal studies are a valuable tool in biomedical research for investigating the effects of various substances on biological systems, they have several limitations that must be considered. These studies are often conducted under highly controlled conditions that do not reflect the complexity of real-world environments. While animal studies have suggested that date palm and goat milk may have potential benefits for iron metabolism, it is challenging to extrapolate these findings to humans due to differences in physiology, metabolism, and susceptibility to disease. Additionally, animal studies often have limited sample sizes and short study durations, which may not adequately capture the long-term effects of the interventions being studied. Therefore, clinical trials involving human participants are needed to investigate the effects of date palm and goat milk on iron metabolism in individuals with IDA. Even though date palm and goat milk are generally considered safe, it is crucial to investigate whether their consumption has any potential adverse effects. Dose-response studies involving the administration of different doses of date palm and goat milk can be performed to establish the optimal dosage range for improving iron metabolism while minimizing any potential adverse effects. Furthermore, it would be useful to investigate the potential synergistic effects of date palm and goat milk with other dietary factors that are known to affect iron metabolism, such as vitamin C or phytate. Processing methods such as fermenting and type of extraction may influence their composition and bioactivity, which, in turn, may affect their iron bioavailability. Finally, studies could also explore the effects of date palm and goat milk on other health outcomes, such as inflammation, oxidative stress, and gut microbiota to determine if they have any additional health benefits beyond improving iron metabolism.