BDA The Association of UK Dietitians
Oncology
Haematology Sub-Group

Guidance
Safer eating with Neutropenia

Summary
This document provides guidance for the provision of consistent advice on neutropenic dietary restrictions for haematology patients. It provides evidence/ best practice guidance for haematology patients undergoing chemotherapy as well as those with more profound neutropenia undergoing stem cell/ bone marrow transplantation. This is a guideline for those units who chose to continue to advise dietary restrictions during neutropenia. It is not intended for people with neutropenia of a non-haematological cause.

Background
After chemotherapy and stem cell transplantation, patients are at a greater risk of infection from bacteria or fungus in food. This is for the following reasons:

- The white blood cells (neutrophils) that would usually fight food poisoning bacteria are at a low level. This is called neutropenia
- The gut lining which acts as a barrier between bacteria and the bloodstream is damaged by chemotherapy and radiotherapy. This makes it easier for bacteria to cross into the blood stream.

The 'Neutropenic Diet' has remained a controversial area across Haematology Units in the UK. The evidence for dietary restriction during immunosuppressive therapy and/ or neutropenia is still limited and some institutions have removed restrictions without any corresponding increase in infection rates (1). Due to concerns regarding inconsistent and inappropriate dietary advice during neutropenia, the Haematology Group of the British Dietetic Association established recommendations that were first published (2) and amended five years later. Our group recognised that the evidence for this guidance needed to be re-visited, further up to date research and consultation has now led to updated recommendations.

Purpose
The purpose of this statement is to:

- To standardise dietary advice provided to haematology patients undergoing treatment throughout the United Kingdom using evidence/ best practice guidelines.

- To enable dietitians working with haematology patients to confidently be able to advise about neutropenic dietary restrictions.

Recommendations

Following a literature search, which includes articles published in the last five years, we have gathered the following recommendations for our patient group.

Food Safety

Evidence is emerging to support following food safety guidance, around food preparation, storage and good hygiene practices as well as being mindful of the way we cook our food. Below are some helpful tips for Food Safety, taken from The Royal Marsden 'Food Safety information' booklet (2019)

- Avoid contamination of food by ensuring you washing and dry your hands before touching or eating anything.
- Never touch your mouth or nose when preparing food. Cover any cuts on your hands before preparing food.
- Do not allow raw and uncooked foods to mix – use separate storage shelves and different chopping boards
- Sanitise hands, chopping boards, knives, and utensils using hot water after touching raw meat, fish or vegetables.
- Always cover food to be stored to prevent contamination.
- Never overload your fridge or freezer - This can cause an increase in temperature, making food unsafe to eat.
- Defrost food in the fridge, not at room temperature.
- Be aware of shared utensils such as tongs at buffets, as these may have been handled by many people and may have contaminated food
- When shopping, buy chilled and frozen foods last to limit the time it is kept at warmer temperatures.
- Avoid bruised fruit and vegetables or damaged packages or tins.
- Always check 'use by dates' and 'best before dates' before buying or eating food.
- Always keep pets away from food preparation areas as they may carry bacteria even when well.
- If storing cooked food, ensure it is cooled at room temperature before placing in fridge or freezer.
- Never refreeze thawed food.
- Avoid reheating rice and takeaway food as harmful bacteria can survive the heating process.
- When eating out, check the food hygiene rating of restaurants and takeaways or access your relevant Food Standards website (3).

Table 1. Food safety advice when neutropenic (neutrophils of <1.0)

Avoid	**Alternatives**
All unpasteurised dairy products e.g. milk sold on local farms	Any pasteurised milk, soya milk, Jersey milk or UHT milk
Soft cheeses made with unpasteurised milk e.g. feta, parmesan Homemade/deli paneer and labneh Mould-ripened cheeses e.g. Camembert, Brie, goat's cheese Blue veined cheeses e.g. Danish blue, Blue Stilton	Cheeses made with pasteurised milk, processed cheese e.g. Dairylea, Kraft, Philadelphia, mesh and halloumi White Stilton Pasteurised parmesan, pasteurised mozzarella. Paneer made with pasteurised milk

	Vacuum-packed pasteurised and hard cheeses e.g. cheddar and Edam
Stuffed vine leaves, Fattoush and tabouleh, alfalfa (sprouted seeds) Damaged/ bruised/ over-ripe Fruit/vegetable Freshly squeezed commercial or smoothies	Fresh fruit, vegetables and salad – including prepacked Salad and fruit. Ensure all above are well washed before eating Raw dried fruit, products containing these e.g. muesli, Bombay mix, confectionary UHT or long-life fruit juices – in cartons or jars Pasteurised smoothies Tinned or frozen fruit and vegetables Cooked dried fruit e.g. in fruitcake, flapjacks or cereal bars
Fresh nuts, nuts in shells	Cooked nuts, nuts in cans Peanut butter, roasted nuts
Raw or lightly cooked shellfish	Well-cooked shellfish e.g. prawn Curry
Raw/undercooked meat, poultry or fish e.g. meat which is still pink, caviar and oysters Smoked meats e.g. salami Avoid smoked salmon unless eaten directly from a freshly opened packet	Well cooked meat, poultry and fish; tinned meat and fish Vacuum-packed cold meats such as turkey and ham stored below 3°C and eaten following the manufacturer's instructions Vacuum packed fish eaten straight from a new packet. This includes smoked salmon.
Raw eggs or undercooked eggs e.g. homemade mayonnaise, homemade ice cream, mousse, egg-nog, meringue, hollandaise sauce, and béarnaise. Any dressing containing raw eggs e.g., home/restaurant-made Caesar salad dressing	Hard boiled eggs; shop-bought mayonnaise and other products made with pasteurised egg
Probiotic foods, drinks or supplements e.g. Yakult, Actimel, ProViva Yogurt which is described on the label as probiotic	Any yogurt that does not describe itself as probiotic including live, plain, Greek and fruit yogurts
Meat pate, vegetable pate	Pasteurised pate and paste in tins or jars that do not need to be refrigerated

Unpasteurised or 'farm fresh' honey and honeycomb	Pasteurised or heat-treated honey Ideally try to use individual sachets or portions
Unnecessarily large packets of food items from pick and mix, universal jars Deli counter foods e.g. olives, houmous, shawarma and baklava	Ideally, packets should be individual portions e.g. butter, sweets, pickles Prepacked Houmous and olives
Ice when away from home e.g., in a restaurant and slush puppies	Ice made from appropriate water sources (see above)
Ice cream from ice cream vans	Ice cream from reputable sources, individual portions, wrapped, small pots
Non-drinking water, bottled mineral or spring water, water from wells, water from coolers, domestic water filters and water fountains	Freshly run tap, carbonated water Please check with your hospital for guidance

Ice Cream

Ice cream is used as a quick high calorie snack for many of our patients. There is inadequate research available to give evidence-based guidance; therefore, the recommendations are based on group consensus. When considering the manufacturing process, it was felt that ice cream is unlikely to present a significant risk, provided it has been stored at the correct temperature, had not previously thawed, was individually wrapped and from a reputable source. This excludes ice cream sold from mobile vans including ice cream from soft serve machines that may harbour unacceptable levels of bacteria.

Conclusion

Emerging evidence has increased the amount of food items our patients can consume during treatment; however, the lack of evidence still remains a problem when providing advice to neutropenic individuals. However, it is felt by many that immunocompromised patients should avoid all unnecessary risk for potentially life-threatening infections.

Ensuring a consistent and sensible approach to the dietary advice given during neutropenia should help minimise both the risk of food borne infection and worsening malnutrition at a time when nutritional intake can be severely compromised.

References

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