

FUELLING ADVENTURE AT ALTITUDE

Using your time to plan your next big adventure? If you're considering taking off to the mountains when restrictions are lifted, this article outlines how to prepare your nutrition to get the most out of your adventure.

From hiking to rock climbing and mountaineering, more people are taking to the mountains in search of their next challenge. It is important to acknowledge the physiological changes that occur when exercising at altitude and the impact this has on nutritional requirements. Careful consideration is needed to ensure your nutritional needs are met to fuel your experience.

The amount of food you will need will vary depending on the length of the trip and the intensity of exercise. Staying fuelled and hydrated for the duration of the trip is essential to maintain energy levels and concentration, so you can stay safe, perform at your best and enjoy every moment in the mountains.

This post provides advice for long mountain days, or short hut-to-hut trips where you can take food supplies. Longer expeditions will require additional considerations, i.e. freeze-dried meals.

Below are a few key points to consider when prepping your nutrition.

The effects of altitude (1,2,3,4):

- Suppression of appetite. The reduction in appetite is thought to be partly due to the upregulation of the hormone leptin, which is responsible for controlling body weight by inhibiting hunger.
- Reductions in appetite are maximal in the first several days upon arrival to altitude where caloric intake can decrease around 40%. The most profound effects have been studied at altitudes of 5000m+, however if you live at sea level you are likely to feel the effects at moderate altitudes.
- Along with an increase in resting metabolism, there is normally a high energy cost of activity meaning there is a risk of energy imbalance (expending more energy than you are taking in).
- Exposure to altitude can lower the immune response.
- Increased hydration needs due to reduced moisture in the air, increase in urination, increased breathing rate and physical exertion.

How to combat the effects of altitude:

- ✓ Prepare high carbohydrate and high fat snacks, aim to eat little and often, even if you don't feel hungry. This will maintain energy levels and support the immune system.
- ✓ Have different flavoured snacks prepared, sweet and savoury, to encourage you to keep nibbling.
- ✓ Consider increasing iron rich foods leading into longer trips (to support haematological adaptations), this is particularly important for women who tend to have naturally lower stores. The most easily absorbed sources of iron are from animal sources i.e. red meat, poultry, fish and eggs. However, Iron is also found in many plant-based foods i.e. green leafy vegetables, tofu/tempeh, nuts and seeds. Consume vitamin C rich foods along with plant-based sources (i.e. chopped tomatoes with lentils) to increase the absorption of iron.
- ✓ Start the day hydrated and keep sipping little and often. Have bottles/ camelbaks easily accessible and aim for ~6 gulps every 15-20 minutes, or more according to thirst. Remember that camelbaks can freeze in cold environments so have bottles when going to high altitudes or fill up with warm water.
- ✓ Add an electrolyte sachet/ or a pinch of salt to a water bottle along with flavoured squash to hydrate and provide a source of energy.
- ✓ Take flasks of tea to encourage fluid intake.
- ✓ Check the colour of your wee to assess hydration, aim for a light straw colour!

- ✓ RECOVERY: Aim to consume a snack within 30 minutes after you stop. Keep taking on fluids- mainly water, consider an electrolyte sachet if you have been unable to take on regular fluids and/or have sweated a lot.
- ✓ If staying out in mountain refuges, try to have a full evening meal within a couple of hours of stopping. Aim for a carbohydrate rich meal with a protein source (i.e. Pasta with chicken/lentils).
- ✓ As mountain options can be limited, have backup snacks prepared i.e. bagel with banana and peanut butter. It's essential that you replenish your energy stores and start to recover your muscles, so you're ready to go the following day!

Summary

Being at altitude has increased physiological demand, therefore nutrition preparation is vital to ensure you get the most from your mountain experience. Energy and hydration needs increase, at the same time as appetite is reduced. Go prepared with a variety of snacks and flavours and keep sipping and nibbling throughout the day to stay fuelled and hydrated.

Example of food prep for a day in the mountains:



Recipe: Homemade Energy Bars

Ingredients:

- Oats (1 cup)
- Nut butter (3 tb)
- Flax seed (2tb)
- Chia seed (1 tb)
- Honey (3tb)
- Mixed seeds (2tb)
- Mixed dates and raisins (1/3 cup)
- Cocoa powder/ orange zest (add to different batches for different flavours)

Directions:

- Combine all the ingredients in a big bowl with a dash of water
- Place into a lined baking tray and chill in the fridge for 60 minutes.
- Remove and cut into snack size bars. Wrap in foil so they are easy to unwrap and enjoy on the mountain

Additional resources:

Carbo loading: <https://www.themovement-menu.com/post/carb-loading>

Recovery food: <https://www.themovement-menu.com/post/recovery-food>

Jessica Neil, Registered Associate Nutritionist at The Movement-Menu

Instagram: [themovement.menu](https://www.instagram.com/themovement.menu)



References:

1. Body mass regulation at altitude. Westerterp KR, Kayser B Eur J Gastroenterol Hepatol. 2006 Jan; 18(1):1-3.
2. Ambrosini G, Nath AK, Honigmann MR, Riveros J. Transcriptional activation of the human leptin gene in response to hypoxia. Involvement of hypoxia-inducible factor 1. J Biol Chem. 2002;277:34601–34609.
3. Mazzeo RS. Altitude, exercise and immune function. Exerc Immunol Rev2005;11:6–16.
4. Kayser, B. Nutrition and energetics of exercise at altitude. Theory and possible practical implications. *Sports Med.* 1994, 17, 309–323