

Nutrition, Dehydration, Hypoxia and Recovery[§]

Flying gliders successfully and safely requires mental alertness and good decision making over a long period of time in a hot environment, probably after being in the sun preparing equipment for the flight. A competition, regatta or gliding camp requires good decision making and alertness over many days of tiring activities in the heat on the ground and in the air, whilst also sleeping and living away from home. Many pilots have attended the gliding venue from much kinder environments and are unaware that the stress effects of the heat and competing are accumulative. This fatigue and stress build up is very subtle, leading to irritability, indecision, bad decisions and unsafe actions.

In addition to the environment, other factors which affect the pilot's fatigue and stress accumulation, and cognitive thought processing abilities; are nutrition, dehydration, hypoxia and recovery. Fortunately, unlike the environment, all of these are controllable by the pilot.

Nutrition

The two most important factors with respect to nutrition are a balanced diet and appropriate blood sugar levels.

Much is written about **balanced diets**, typically concentrating on 70 to 80 % fruit and vegetables and the balance in protein and other carbohydrates. Clearly this is in conflict with what a lot of Australians eat. However, being mindful of the need for high levels of fruit and vegetables, and attempting to eat high levels, will help your energy levels through the vitamins and minerals they supply. You should also listen to your body. Take note of what you have eaten in the 24 hrs prior to a period of low energy - or high energy. See if a pattern can be detected after a while. A lot of people are unaware that, for them, too much wheat, yeast or lactose can produce fatigue. Simple sugar foods, soft drinks, tea, coffee, and alcohol may provide short term energy bursts but are invariably followed by relapses. Try a week of high concentrations of fruit and veg or the longer lasting easier digestible veg juice and see if you feel more energised.

Of course you can go to a naturopath and get tested for food allergies or preferred foods for your body. Just don't get too hung up on the results though - just use it as a guide to your own experimentation.

At a contest, try to maintain your normal diet in spite of the difficulties. In particular avoid an increased consumption of fats, sugars, starch and breads. Try to opt for a greater percentage of Asian foods if eating out a lot whilst away. These have higher veg to protein and fat contents.

Maintaining an appropriate range of **blood sugar level** is very important. Blood sugar is the fuel for the brain. Low levels produce slower thinking, reduced focus and concentration, with subsequent indecision, bad decisions, poor co-ordination, narrowing of vision and can lead to accidents.

After eating a balanced meal, blood sugar levels will rise with digestion and then fall more slowly over the next two to three hours if the foods are balanced. However, if high sugar and carbohydrates are consumed the levels will rise very quickly to an excessive level and fall very quickly resulting in a rapid decline in brain power and a feeling of lethargy.

Therefore, ensure you eat a proper lunch either before flight. A salmon, tuna or chicken salad would be ideal. If you have to take it with you ensure a lot of salad compared to the bread. It

[§] Author, John Buchanan. Gliding Federation of Australia (GFA) Safety Briefing Pack.

is better to make a pita bread wrap. I also take 2 bananas and 1 or 2 apples depending on the expected duration of the flight.

The salads or wraps should be a reasonable mix of food and allow prolonged control of blood sugar levels. The bananas are a slow complex sugar as well as vitamins etc, and also release into the blood over a relatively long period. The apples are a faster complex sugar - best kept for final glide or escaping from an energetic grovel. Minimise the nuts and dried fruit as they will contain a lot of sugar and fat. Breakfast bars are ok if you look to the low sugar and don't make a habit of it. Lollies are bad and to keep eating them and/or soft drinks will give you hits with progressively bigger downers resulting in fatigue and reduced mental performance particularly in the heat.

Dehydration

Lack of water produces fatigue, muscle stiffness, cramps and all the adverse brain power effects associated with low blood sugar levels. I know of two top international pilots who have “lost it” in flight and attributed it to dehydration. It is commonly believed that dehydration has been a factor in accidents in the past. I am sure that many pilots, including many of you, have suffered adversely, when flying due to dehydration. Do not underestimate the effects of our hot climate and the accelerated effects of the canopy and lower density altitudes.

The effects accumulate quite subtly and begin before take off. Stay in the shade and keep covered as much as possible before flight. Wear long clothes. Avoid drinking tea, coffee and soft drinks as they repel the moisture uptake of the body. Drink an excess of water with the view to “super hydrating”. Do this slowly over a period of time for maximum uptake. Yes you will pee more, but not as much as you think (unless you’re an elderly gent before the op!).

If you notice effects of dehydration or expect to fly for a very long time, some sports drinks can help you hydrate or rehydrate by providing various salts and minerals. However, avoid the older types and those with high sugar content. Even then it is best to dilute them with two to three times their amount with water and drink them slower, using plain water in between.

I find that mixing a third pure, unsweetened apple juice or dark grape juice in water provides you with a more pleasant and sweet taste in flight and the carbohydrates contained will better replace the energy you are burning.

You should pee during a glider flight, in hot conditions after 2 hours or so. If you don't you are not drinking enough and you will be dehydrating. You may then encounter (although not notice - unless you are now more aware) tiredness, headaches, stiffness and cramps. The pee should be clear - not like the diluted apple juice. If there is any yellowing or smell, drink more clear water.

Alcohol is not only a diuretic but aviation medical research shows that its effects remain in the body for several days - with a resulting loss of mental abilities. However, we are presumably on “gliding holidays” so one glass or can per night is perhaps a compromise?

Hypoxia

Whilst oxygen is compulsory above 10,000 ft QNH, it would be better to use it above 8,000 ft if flying above this altitude for some time. This is because our type of flying is a lot more physical than other forms of aviation and is usually combined with heat, mental, environmental and competition stress. Accelerated fatigue, tiredness, reduced mental alertness

and headaches are the symptoms of prolonged exposure to reduced oxygen use. All these effects are initiated through lower oxygenated blood levels to the brain and can be damaging to the brain!

Be wary of convincing yourself that you can handle 10-12,000 ft continuously because you are fit or used to it! To test yourself, take a sniff after exposure for a while at 8,000 ft. It is very likely that you will experience a clearing of the head and any energy level increase. I feel it is unfortunate that we do not use oxygen a lot more in our gliding in Australia and believe that we should have it at competitions for safety reasons and use above 8,000 ft QNH.

Recovery

Recovery is the process of rejuvenating the body and mind after the flight. This is necessary for continued optimum daily performance. A reasonable level of physical fitness will aid recovery.

The first step after flight is to drink plenty of water with the intent of peeing regularly. Drink at least a litre specifically before having a soft drink, beer, tea or coffee. Then attend to your glider and domestics.

Follow this with 10 mins of simple stretching exercises to get the blood circulating and the muscles working properly. Try to stretch as many muscles as possible - particularly the stiff and sore ones.

Relaxation is the next priority. A good walk, swim, shower and lie down - whatever. The meal should not be too heavy or pumped with highly emotional post mortems.

Before going to bed resolve to put the flight away and don't dwell on it as that will prevent you from getting a good night's sleep.

Complete the recovery by conserving as much energy as possible the next morning before flight.

Then go get 'em!

John Buchanan