

# BEATING JET LAG

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Through advances in nutritional technology, jet lag, that dragged out feeling of fatigue and disorientation that accompanies high-altitude, high-speed travel, is now much easier to avoid.

Research into jet lag at first concentrated on the biological clock (time change) factor. Greater experience with north-south travel and aircrew patterns involving **no time change** showed that the time change effect was only a small part of a larger problem.

Air industry regulatory bodies worldwide, in the light of experience, have set maximum weekly, monthly and yearly exposure times for aircrew safety purposes. **The governing factor in these limitations is flying time exposure, not time change encountered.** The laws framed to govern pilot flight time are rigidly enforced in spite of the increase in costs this brings to the operators. It is obvious from the uniformity of government action that legislators recognize that the fatigue problems of flying are real and are detrimental to the air traveller.

Expanding knowledge of the effects of high altitude travel on our body's metabolism has offered new ways to alleviate and possibly eliminate jet lag.

## Environmental Hazards of Jet Travel

An integral part of the jet era is the traveller's exposure to radiation and ozone from high altitudes, and cabin pressurization, which makes the journey possible.

The atmospheric layer which surrounds the earth acts as a safety blanket blocking out most of the high energy ionizing radiation: ultraviolet, gamma rays, cosmic rays and x-rays, coming from outer space. As the height above the earth's surface increases, the safety blanket reduces in both depth and density, which results in an increase in the level of many types of radiation.

Also, ozone, a highly active gas molecule, is found in increasing con-

centrations at altitudes in which jet aircraft operate.

Air density and pressure inside the cabin are reduced with altitude and so aircraft have to be pressurized to sustain life. This is done by taking a large volume of low density air, compressing and cooling it and then ducting it into the cabin to keep the air pressure level inside to below 6,000 to 8,000 ft. (approx. 2 km). The result is an environment with a rich positive to negative ion ratio, slightly reduced available oxygen and exceptionally low humidity. All of these environmental factors are detrimental and contribute to jet lag.

## Free Radicals and Jet Lag

All of the environmental hazards of jet travel disrupt the body's cellular harmony creating an excess of toxic chemical molecules called **FREE RADICALS**. High energy ionizing radiation converts the water and oils within the cells to free radicals. Ozone breathed in and entering the lungs is a highly active free radical. Also, the reduction in negative ions, the reduced available oxygen, and dehydration caused by pressurization inhibits the repair functions within the cells.

**Free radicals are molecules with an unpaired electron in their structure.** These molecules have a great need to make this single electron into a pair, which they do by grabbing an electron away from the first molecule they contact. The contact molecule then becomes short of one electron and immediately tries to grab another one to this empty position. So, from each free radical formed in this manner, a chain reaction of destruction commences and continues until stopped by the body's natural defenses. **During these chain reactions undesirable chemical bonds, or 'cross-links', are formed within the cells, many or which are permanent and degrade the function of the affected cells.** The free radicals causing these chain reactions are called **superoxides, lipid peroxides and hydroxyls.**

The body's natural defense against free radical damage is mainly in the form of

enzymes - **glutathione peroxidase (GP), superoxide dismutase (SOD), methionine reductase (MET), and catalase (CAT).** These enzymes have the ability to fill the unpaired electron position without themselves becoming a free radical, thus quenching (stopping) the chain reaction.

The normal operation of our cells gives rise to some free radicals which are quenched by the body's own enzyme defenses, however these defenses are limited and the aircraft environment can overload the normal cell enzyme defenses allowing free radicals to accumulate. This is especially true of longer international and coast to coast flights, causing fatigue and loss of vitality until the free radicals can be removed and, hopefully, the cell damage can be repaired.

## Beating Jet Lag **BIOPHARMS**

### ENZYMES

A product resulting from the high tech era of plant genetics has resulted in a reliable, high-potency source of the specific enzymes which remove free radicals: **glutathione peroxidase (GP), superoxide dismutase (SOD), methionine reductase (MET), and catalase (CAT).** These same products have been used successfully for over 10 years by veterinarians, nutritional medical doctors, and health enthusiasts. The author and a number of his business associates have been using these new enzymes to counter jet lag with great success.

After several years of practice, trial and error, a specific dosage regime has been developed. **Please consult the bottle label for complete directions.**

This system is a useful guideline, **however any system that keeps the body loaded with the enzymes will work fine.**

It is important that water intake should be kept high throughout the flight to prevent dehydration. **The water intake may be just as important as the amount of enzyme tablets ingested.**