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DOCUMENT TITLE
HUMAN PERFORMANCE AND LIMITATIONS

CHAPTER 2 – DIET AND EXERCISE

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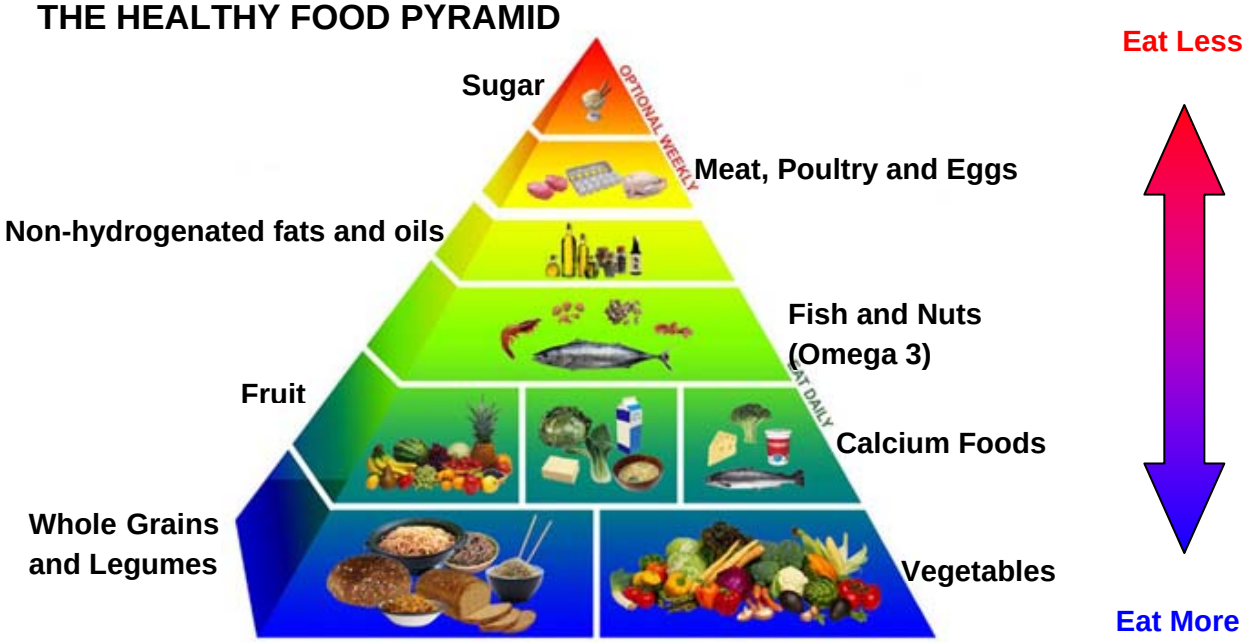
CONTENTS ..... PAGE

DIET AND EXERCISE

Introduction

Commercial airline flying is a sedentary occupation, involving disturbed sleep patterns, and periods of moderate to high stress, with restricted ability to exercise and choose your preferred diet. For these reasons it is desirable that pilots (indeed everybody) follow sensible diet and exercise regimes.

THE HEALTHY FOOD PYRAMID



A poor diet makes a body susceptible to illness. Missing meals can affect performance.

FITNESS

'**Obesity'** is being significantly overweight.

Factors that can contribute to excess weight include:

- Too much sugar in your diet
- Too much fat in your diet
- Too much salt in your diet
- Not enough fruit and vegetables
- Not enough exercise
- Excess alcohol consumption

This can lead to many health problems including:

- Atherosclerosis (blocked arteries) and other heart diseases
- Hypertension (high blood pressure)
- Osteo-arthritis (joint & bone problems, especially hips and knees)
- Diabetes (problems regulating blood sugar)
- Gout (excess uric acid crystallising in joints)

For a human being to maintain a constant weight there must be a balance between the energy taken in (by means of food) and the energy expended by our normal living activity or by additional exercise. It we take in more food than is necessary, the excess will be stored as body fat. The body is a very efficient at converting our food into energy and it is difficult to lose weight simply by exercising more. We would need to run about 2 kilometres to burn the energy contained in one slice of bread.

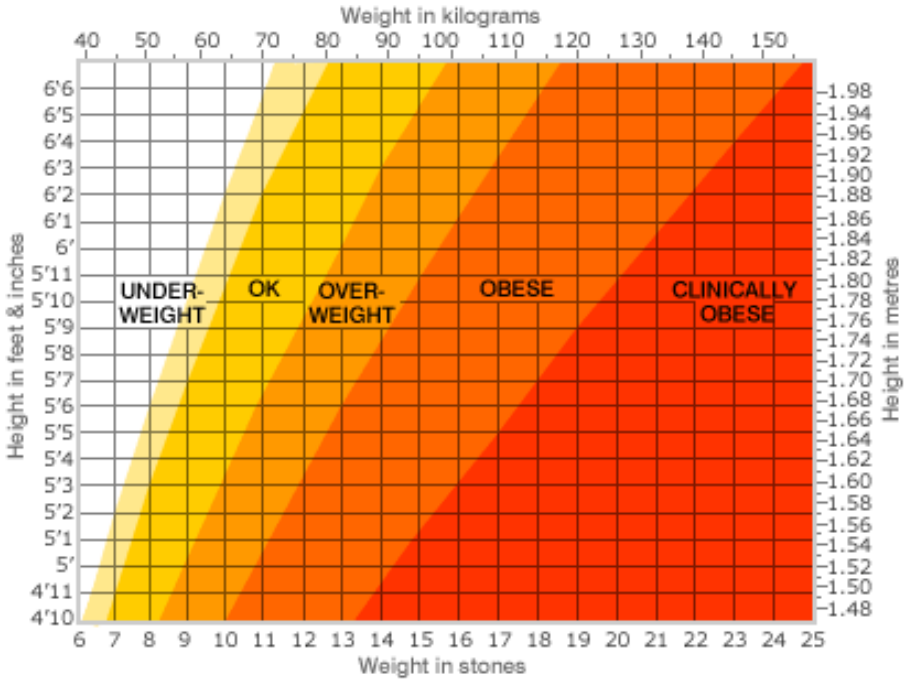
The fastest way to lose weight is to modify your diet. However, diet associated with a regular exercise program is highly desirable, as exercise provides numerous additional benefits. One of these is to increase our metabolism, and so increase the rate at which our bodies burn energy.

BODY MASS INDEX (BMI)

Medical examiners commonly use a measure known as 'Body Mass Index' to determine whether a candidate is at a desirable weight.

$$\textbf{BMI} = \frac{\text{Wt in Kilograms}}{(\text{Height in metres})^2}$$

- 19 to 25 is considered normal
- greater than 25 is considered to be overweight.
- greater than 30 is considered obese, with a greatly increased risk of developing the diseases listed above.



BMI Chart

EXERCISE

Fitness can only be achieved and maintained by attention to diet and following an effective exercise program. Exercise improves fitness and improves both physical and mental performance as well as assisting towards a longer, healthier and more active and pleasurable life.

Because of the particular nature of long-haul airline operations, pilots must address the problem of maintaining regular exercise in changing schedules and locations.

Exercise:

Reduces	Improves
• Heart rate • Fat deposits in arteries • Heart disease • Blood pressure • Depression • Anxiety • Obesity	• Circulation • Posture • Memory • Motivation • Self confidence • Co-operation • Tension

To be effective, exercise must be:

- regular
- at least 20 - 30 minutes duration in each exercise period
- a minimum of 3 - 5 times per week
- sufficient **to approximately double resting heart rate.**

The type of exercise can be of your choosing – walking, swimming, cycling, etc.

Care should be taken by some individuals in attempting to double their resting pulse rate. The stable pulse rate achieved during exercise will depend on the individual's Ejection Fraction (a measure of the pumping efficiency of the heart). Those with a high Ejection Fraction may have difficulty in safely doubling their resting pulse rate.

Exercise programs involve:

Mobility: These exercises allow full movement of limbs. This capability is important for a pilot, as there is a need to effectively reach all flight controls, including those in the overhead panel.

Strengthening: Exercises provide us with reserves for special exertion.

Aerobic: This improves the condition of the heart and lungs and increases the amount of blood and oxygen that can be moved around the body. As we will see later, this is an important consideration for pilots—a lack of oxygen to various body organs will cause us problems.

Before commencing an exercise programme you should record your resting heart rate. During training you should check your heart rate as it provides a guide to the effectiveness of the exercise. It also helps guard against overexertion. ***A useful measure of fitness is the time taken for the heart rate to return to near the resting rate.*** As your fitness increases, the time required to return to a near normal heart rate will reduce.

A useful guide to your training heart rate is given by the following formula.

For commencing training: $\frac{60}{100}$ x (220 - age).

When some fitness is achieved: $\frac{70}{100}$ x (220 - age).

It is advisable to discuss your fitness with a doctor before starting a programme and with a fitness instructor to develop a programme suited to your needs.