**Keys experiment:**

In the 1950’s, a research study (Keys et al, 1950) found some fascinating results that help us to understand the effects of dieting and starvation in eating disorders today. A researcher called Ancel Keys asked 36 healthy men to participate in his study. The men were monitored closely during the first three months while their eating patterns and personalities were studied. They were then put on a strict diet and their normal food intake was halved for three months. In the final part of the study the men were reintroduced to eating normal amounts of food.

The researchers’ observations astounded them. Food became the main topic of conversation for all the men during the three-month starvation period. Many of the men began dreaming about food, and were fascinated by cookery books and menus. Some of the men found it impossible to stick to the diet and secretly ate on impulse, and expressed feeling extremely guilty after doing so. Emotionally, the men became more anxious and depressed and had trouble concentrating. They also began to withdraw from other people and were much less sociable and friendly. Some of the men who had no previous concerns about their body image became more critical of their bodies, and some complained of being overweight, even though they had lost weight.

When they were introduced to normal eating again, many of them felt as though they would not be able to stop eating when they were full, and found it difficult to estimate what was a normal portion of food. Their normal eating habits returned after a period of time eating normally and they also lost their intense focus on food.

**Effects of starvation on the body:**

The experiment involved restricting the calorie intake of 36 young, healthy, psychologically normal men who had volunteered for the study. During the first three months, they ate normally while their behaviour, personality, and eating patterns were studied in detail. During the next six months, the men were restricted to approximately half of their former food intake. On average they lost 25% of their original body weight. This was followed by 3 months of rehabilitation, during which the men were gradually re-fed.

**Attitude and behaviour related to eating:**

One of the results of starvation was a dramatic increase in preoccupation with food. The men found concentration on their usual activities increasingly difficult, since they were plagued by persistent thoughts of food and eating. In fact, food became a major topic of conversation, reading and daydreaming. Many of the men began reading cookbooks and collecting recipes. Some developed a sudden interest in collecting coffee pots, hot plates and other kitchen utensils. This hoarding even extended to non-food related items. Despite little interest in culinary matters prior to the experiment, almost 40% of the men mentioned cooking as part of their future plans when the experiment was over.

During the starvation period, the men’s eating habits underwent remarkable changes. The men spent much of the day planning how they would eat their ration of food. They behaved in a way that would make eating last longer and enjoyment of food would be increased. They toyed with their food and smuggled out bits from the dining room to eat in drawn out rituals on their bunks. They demanded their food be served hot and made unusual concoctions by mixing foods together. There was an increased use of salt and spices. The men often ate in silence and devoted total attention to consumption. The consumption of tea and coffee increased dramatically, similarly chewing gum became excessive.

**Emotional changes:**

Although the men were psychologically healthy prior to the experiment, most experienced significant emotional changes as a result of semi-starvation. Some reported brief and others longer periods of depression. Occasionally elation (extreme happiness) was observed, but this was inevitably followed by ‘low periods’. Although the men were quite tolerant and patient prior to starvation, tolerance was replaced by irritability and frequent outbursts of anger. For most of the men, anxiety became more evident. Some men neglected various aspects of personal hygiene. These emotional disturbances did not vanish immediately during rehabilitation, but persisted for several weeks, with some men actually becoming more depressed, irritable, argumentative and negative than they had been during semi-starvation.

**Cognitive changes:**

The volunteers reported difficulties with concentration and alertness. Their ability to understand and their sense of judgement deteriorated.

**Social changes:**

Although originally quite sociable and friendly, the men became gradually more withdrawn and isolated. Humour and the sense of comradeship diminished markedly amidst growing feelings of social inadequacy and lack of confidence. The men became reluctant to plan activities, to make decisions, and to participate in group activities. The volunteers’ social contacts with women also declined. Those who continued to see women socially found the relationships became strained.

**Physical changes:**

As the six months of semi-starvation progressed, the men exhibited many physical changes, including: stomach ache, decreased need for sleep, dizziness, headaches, hypersensitivity to noise and light, reduced strength, poor motor control, oedema (an excess of fluid causing swelling), hair loss, decreased tolerance for cold temperatures, visual disturbances, auditory disturbances (ringing noise in the ear), and parasthesia (abnormal tingling or prickling sensations). There were decreases in the body temperature, heart rate and respiration.

**Why is this important?**

Reducing food intake over an extended period of time seems to have very powerful effects, not only on our bodies, but also the way we think and feel. The experiences of these men back in the 1950’s are not dissimilar to the thoughts, feelings and behaviours reported by many women and men struggling with an eating disorder today.

It seems that some of the symptoms of eating disorders (such as thinking about food a lot of the time) are a direct result of our bodies being starved or considerably below a healthy weight. This is important to know as, all too often, individuals who are suffering with eating disorders believe that their thoughts about food prove that they are a weak person whose hunger needs to be controlled. In fact, most people would experience the same feelings of anxiety and depression, preoccupation with food and negative thoughts about their body and shape when their bodies are being starved; it is simply a normal human response to starvation.

This experiment helps us to understand how important it is to get back to a healthy weight range. Although it is extremely scary for someone suffering with anorexia to think about gaining weight, it has been found that many of the powerful effects of starvation are resolved when the healthy weight range is reached. Of course, there are other important parts to treatment, but eating regular meals and gradually getting back to a healthy weight range is an essential part of recovering from anorexia.

**References:**

Eivors, A. and Nesbitt, S. (2005) *Hunger for understanding,* West Sussex, John Wiley and Sons LTD.