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O₂ debt :- Starting The amount of O₂ debt is the amount of extra O₂ taken up after exercise. When the exercise is severe, the energy consumed is more than can be produced by aerobic metabolism. In that case part of energy is supplied by anaerobic metabolism without O₂ supply from outside i.e. O₂ deficit or O₂ debt is incurred. O₂ debt occurs at the start of any exercise when the oxidative processes are yet to pick up fully.

In severe exercise if energy consumption is more than the VO₂ max can supply then O₂ debt occurs in form of glycolysis and thereby production of lactic acid.

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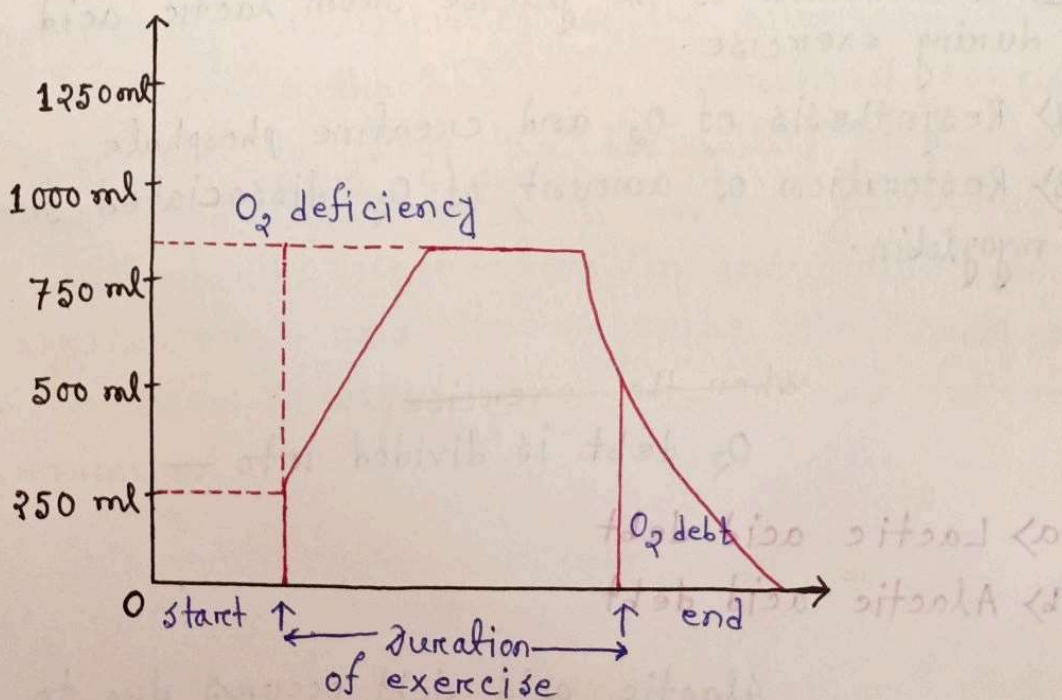


Fig :- Effects of O₂ consumption.

Second wind :— It is a phenomenon seen after sometime of the start of exercise and then the individual feels more comfortable and breathing becomes easier while continuing exercise. Though the cause is not clear, it is thought that a sweetable rise in pulmonary ventilation is responsible for this.

O₂ debt :— After a period of severe muscular exercise, the amount of O₂ consumed is enormously more. The O₂ required is more than the quantity available to the muscle.

This much of O₂ is required not only for the activity of the muscle but also for reversal of some metabolic processes such as :—

- 1) Reformation of the glucose from lactic acid accumulated during exercise.
- 2) Resynthesis of O₂ and creatine phosphate
- 3) Restoration of amount of O₂ dissociated from Hb and myoglobin.

O₂ debt is divided into —

- a) Lactic acid debt
- b) Alactic acid debt

Alactic acid debt occurs due to consumption of O₂ from myoglobin, consumption of high energy phosphate etc.

Lactic acid debt results due to glycolysis and formation of lactic acid. Lactic acid debt comprises the major part of O_2 debt, whereas the amount of alactic acid debt is comparatively very small.

Importance of measurement of O_2 consumption :-

O_2 consumption can be used for calculation of energy expenditure on a task by indirect calorimetry. Besides determining the energy cost of various jobs, O_2 consumption may also be used for assessing the influence of age, sex and nutritional habits on the habitual physical activities and the evaluation of optimal physical activity for normal persons and patients with cardiopulmonary insufficiency. On the other hand, energy expenditure forms the basis for nutritional counselling. It can be used to judge the suitability of a task for a worker and vice versa to develop guidelines for works and rests recreation in industries, mining and agriculture, and to organize the work structures in such a way physical strain and fatigue can be minimized.

Pregame meal :-

The pregame meal supplies an athlete's body with a significant amount of energy an athlete will need for an event. However, it will not supply all the energy needed. Instead, the athlete should eat the right types of food for several days prior to any event in order to charge the muscles with plenty of glycogen, the energy source the muscles use during most sporting activities. The pregame meal will help to stabilize blood sugar levels, hydrate the body, prevent gastrointestinal upset and avoid hunger during the event. There is no single meal or food which is right for every athlete but there are choices that are smarter than others.