INFLUENCE OF FOOD SOURCES ON THE ENERGE CENTERS OF CELLS-MITOCHONDRIA

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Abstract:
Fertility in animals depends on a number of environmental factors, one of which is nutrition along with the food sources consumed, to obtain essential vitamins, minerals, other elements.On the other side, change in nutrient intake is also a direct factor in the functioning of the reproductive system. One of the most important organelles in any mammalian organ, including the ovary, is the mitochondrion.These unique structures are responsible for the energy needs of cells by being involved in metabolic processes and also possess their own mitochondrial DNA (mtDNA). The number and function of mtDNA decline with age in various tissues, including the ovary. It is known that certain nutrients could have an influence over mitochondrial functioning. The deficiency of certain nutrients reflects the metabolic processes that take place in mitochondria (Wesselink et. al.,2019). However, the mitochondrial mechanisms contributing to ovarian aging and infertility are not fully understood. This article aims to describe key evidence and current knowledge on the role of dietary sources over mitochondria in the ovary and to identify potential opportunities to extend reproductive longevity and improve fertility.

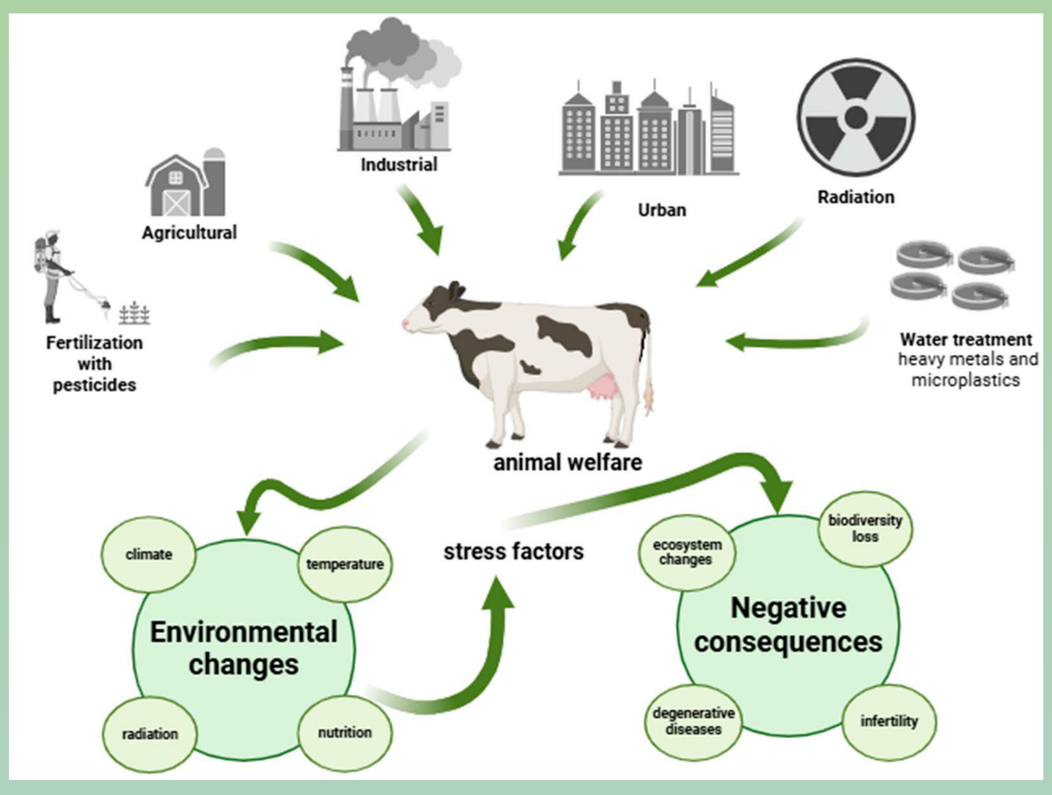

Figure 1. Impact of environmental stress on animal welfare and fertility, as well as on biodiversity(Created in Biorender.com).

Figure 2. Foods that have beneficial effects on mitochondria

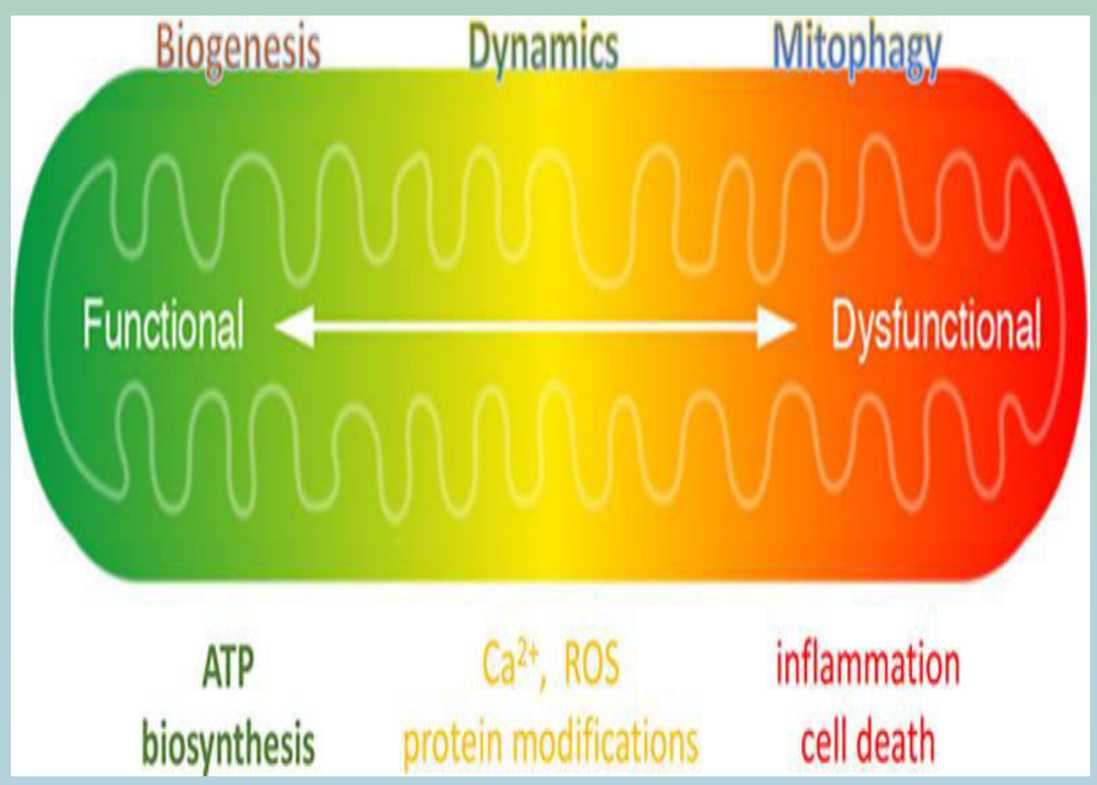

Figure 3. Multiplicity of mitochondrial function.

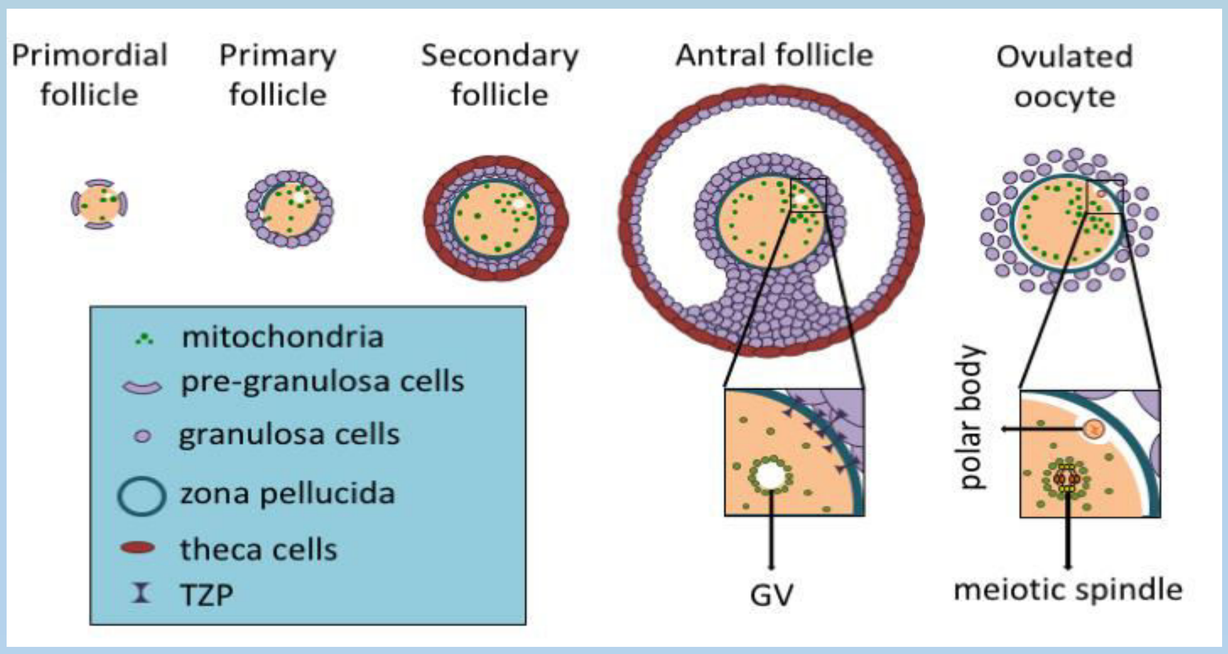

Figure 4. Mitochondria are important for oocytes because the development and growth of the oocyte requires a large amount of energy, which is amplified by mitochondria.

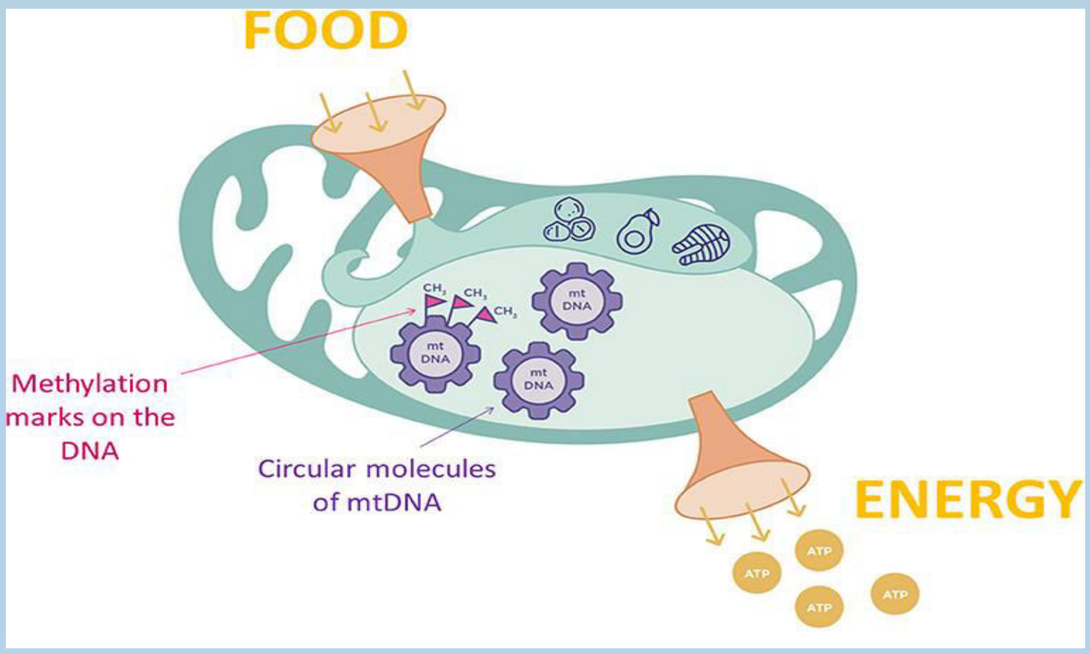

Figure 5. Mitochondria burn food to produce energy, so they are the powerhouses of the cell.The circular molecules of mitochondrial DNA (mtDNA) contained in the mitochondrion help to regulate its functions

Nutrition is an important source of vitamins and minerals that are of particular importance to the individual. Nutritional resources appear as a direct factor that influences the reproductive system. With reduced nutrient intake, ovarian functions decline, and are in a waiting mode for better nutritional conditions. The ovary is a dynamic structure that has high energy needs, which are supported by the energy centers of the cells-the mitochondria.Mitochondria are extraordinary organelles that are localized in almost all cells, and take part in a variety of metabolic processes. The essence of metabolic processes is based on nutrients entering the body (Borcherding and Brestoff , 2023).