Specific Dynamic Action

- The phenomenon of the extra heat production by the body, over and above the calculated caloric value, when a given food is metabolized by the body, is known as specific dynamic action (SDA).
- It is also known as calorigenic action or thermogenic action or thermic action (effect) of food.

SDA for different foods

- For a food containing 25 g of protein, the heat production from the caloric value is 100 Cal (25 x 4 Cal).
- When 25 g protein is utilized by the body, 130 Cal of heat is liberated.
- The extra 30 Cal is the SDA of protein.
- SDA for protein, fat and carbohydrate 32%, 13% & 5%,
- Proteins possess the highest SDA while carbohydrates have the lowest.

SDA for mixed diet

- The presence of fats and carbohydrates reduces the SDA of proteins.
- Fats are most efficient in reducing SDA of foodstuffs.
- For a regularly consumed mixed diet, the SDA is around 10%.

Significance of SDA

- For the utilization of foods by the body, certain amount of energy is consumed from the body stores.
- Expenditure by the body for the utilization of foodstuffs.
- It is the highest for proteins (30%) and lowest for carbohydrates (5%) & for mixed diet 10%.
- Additional 10% calories should be added to the total energy needs (of the body) towards SDA.
- The higher SDA for protein indicates that it is not a good source of energy.

Mechanism of SDA

- SDA of foods is due to the energy required for digestion, absorption, transport, metabolism and storage of foods in the body.
- The SDA of proteins is primarily to meet the energy requirements for deamination, synthesis of urea, biosynthesis of proteins, synthesis of triacylglycerol (from carbon skeleton of amino acids).
- Phenylalanine, glycine and alanine increase the SDA.
- The SDA of carbohydrates is attributed to the energy expenditure for the conversion of glucose to glycogen.
- Fat, the SDA may be due to its storage, mobilization and oxidation.