

Sub Name: PRINCIPLES OF FOOD ENGINEERING

Sub Code: BVFPS202

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ULTRAFILTRATION

- Ultrafiltration (UF) is a variety of membrane filtration in which hydrostatic pressure forces a liquid against a semi permeable membrane. Suspended solids and solutes of high molecular weight are retained, while water and low molecular weight solutes pass through the membrane.
- In renal physiology, ultrafiltration occurs at the barrier between the blood and the filtrate in the glomerular capsule (Bowman's capsule) in the kidneys. As in nonbiological examples of ultrafiltration, pressure (in this case blood pressure) and concentration gradients lead to a separation through a semipermeable membrane (provided by the podocytes). The Bowman's capsule contains a dense capillary network called the glomerulus. Blood flows into these capillaries through the afferent arterioles and leaves through the efferent arterioles.
- The high hydrostatic pressure forces small molecules in the tubular fluid such as water, glucose, amino acids, sodium chloride and urea through the filter, from the blood in the glomerular capsule across the basement membrane of the Bowman's capsule and into the renal tubules. This process is called ultrafiltration; the resulting fluid, virtually free of large proteins and blood cells, is referred to as glomerular filtrate, or ultrafiltrate. Further modification of ultrafiltrate, by reabsorption and secretion, transforms it into urine.