My Project Research Report

The volume and composition of body fluids are maintained at relatively constant values by physiological control mechanisms (Inlander 28). The maintenance of the internal environment in a stable condition is defined as homeostasis (Silverstein 37). Obviously, the kidney is a very important homeostatic organ. Since the human body is nearly two-thirds water, its survival depends largely on the functions and processes performed by the kidneys (Ahlstrom 30). The vital control of the kidneys management of salt and water on which terrestrial life depends, consists of a series of interactions between the kidneys, the brain, the blood vessels, and the adrenal glands. Between them, the volume of the body fluids is kept in balance (Silverstein 40).

It is a very well known fact that when individuals consume large amounts of liquid, they eliminate much of it through urine (Inlander 38). On the other hand, when individuals are dehydrated, very little urine is formed. This certainly illustrates that control mechanisms in the organism can regulate the amount of urine that is formed (Ahlstrom 17).

When tap water is ingested there is a relatively rapid elimination of the water into urine. However, when salt is ingested, there is a considerable delay in the excretion of water because of the saline that is ingested (Silverstein 40). The ingestion of coffee is very quickly followed by the rapid removal of urine as a result of the effect of caffeine (a diuretic) on the kidney (Inlander 42). This effect can be observed with any beverage that contains caffeine (Inlander 42).

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1 Charles B. Inlander has written several books on research of the body and has degrees in Medicinal Sciences.
2 Dr. Alvin Silverstein has written eight books on his scientific research of bodily functions.
3 Timothy Ahlstrom has authored several books on kidney performance and has founded a research institute to further the studies of kidney diseases.
The measurement of pH, color and specific gravity of urine is an indication of whether urine is diluted or concentrated (Silverstein 24). If urine is concentrated, then the pH would be low, the color would be dark yellow, and the specific gravity would be high (Ahlstrom 42). Exercising can cause urine to be more concentrated. A dilute urine, however would have a high pH, be almost colorless and have a low specific gravity (Ahlstrom 42).

A hormone produced by the pituitary gland called antidiuretic hormone or ADH causes nephrons in the body to reabsorb more water and produce more concentrated urine. ADH is secreted when the body becomes dehydrated and needs to absorb more water. When bodies hold back too much water, diuretic drugs are prescribed to treat it and cause them to urinate more frequently.

Under normal conditions, the pH of urine is slightly acidic, because metabolic reactions in the cells generate acidic materials (Inlander 45). The normal pH of urine is about 6; although under certain conditions, the pH can be as low as 4.5 or as high as 8 (Silverstein 47). The color of urine is due to the presence of bile pigments which are the end products of hemoglobin metabolism (Inlander 43). If these pigments are concentrated urine, then the urine would have a darker color. The specific gravity of urine is due to the presence of solutes, most of which is sodium chloride (Ahlstrom 50). A high specific gravity results from the presence of large amounts of solutes as observed in concentrated urine.