Commons beans (*Phaseolus vulgaris* L.) plays an important role in the daily diet for people in developing countries. Being highly nutritious, it has the potential to improve the dietary quality and long-term health of those consuming them regularly. However, beans require long cooking times and contain compounds such as phytates, tannins, flatus, polyphenols, allergens which are undesirable. The objective of this study was to determine the physico-chemical properties of two bio-fortified common beans varieties grown in DR Congo and how they are affected by different processing methods. The bean varieties (HM21-7 and Namulenga) were obtained form CIAT- HarvestPlus. The two varieties were subjected to different physical analysis (dimensions, weight, density, soaking characteristics, change in color). The effect of different soaking pre-treatments (distilled water and Na2CO3) on the hardness of beans was investigated. The effects of soaking, cooking, dehulling, sprouting and their combinations on the chemical composition were studied. HM21-7 was larger in size compared to Namulenga. A 100 seeds weight of 36.3g and 32.8 was recorded for HM21-7 and Namulenga respectively. The soaking solutions had a significant (P<0.05) effect on the hydration coefficient and swelling coefficient. Beans soaked in distilled water were lighter than those soaked in Na2CO3. Soaking in sodium carbonate solution prior to cooking significantly (P<0.05) reduced the hardness of the beans compared to the unsoaked cooked beans and beans soaked in distilled water followed by cooking. Soaking and cooking significantly reduced the levels of nutrients and antinutrients (Phytate and tannins) in the beans. Sprouting showed the highest reduction in antinutrients levels compared to others methods, the highest being after for 3-5 days sprouting followed by cooking. Dehulling process was effective in reducing antinutrients and oligosaccharides. The *in-vitro* Protein Digestibility (IVPD) increased after different processing methods. Sprouting of pre-soaked seeds followed by cooking treatment provided flour of good quality that can be used to in different food formulation to add the value and thus, prevent protein malnutrition. According to our findings, Namulenga variety is a good option for both processing and domestic use based on its short cooking time, low levels of anti- nutrients and high *in-vitro* digestibility.