Abdominal defect such as ventral hernia results from trauma or weakness of abdominal muscles. Another defect such as umbilical hernia is fairly common in calves (Kawcak and Stashak, 1995). The condition is considered to be hereditary occurring in the Holstein-Friesian breed (Rahman et al., 2001). This defect results due to incomplete closure of the umbilicus at birth because of mal-development or hypoplasia of the abdominal muscles. The only effective treatment is surgery to restore the integrity of these abdominal defects, prevent incarceration and strangulation of herniated contents (Ober et al., 2008). Tight suturing to approximate and close these defects can lead to wound dehiscence, recurrence and non-healing of the wound (Matthews et al., 2003). The use of prosthetic material for hernioplasty is required when the hernial ring size exceeds 3 cm in diameter (Vilar et al., 2011). The use of nonabsorbable synthetic mesh materials to achieve a tension-free closure of these abdominal defects is the most widely used reconstructive technique (Bellows et al., 2008). The implantation of the synthetic meshes has been shown to restore abdominal wall integrity and reduce hernia recurrence rates (Burger et al., 2004). However, these materials have also been shown to induce a strong inflammatory reaction and may lead to fibrosis, adhesions to the underlying viscera, and bowel fistula (Eid et al., 2003). These materials may also contribute to post-operative infection, skin erosion and seroma formation (Molloy et al., 1991; Falagas and Kasiakou, 2005). To overcome the disadvantages of synthetic meshes, biomaterials from animal source may be preferable for the surgical repair of hernias (Bellows et al., 2008).

In recent years, biomaterials have gained interest within biomedical sciences due to an ever increasing demand for regeneration or replacement of tissues. It is considered superior to synthetic materials for the repair of abdominal hernias owing to their ability to minimize adhesion formation, provide a better framework for fibroblast proliferation and neovascularization. Moreover, their multidirectional fibrous structure helps in better suture retention, complete absorption and replacement by host tissue (Clarke et al., 1996). They are typically prepared by the decellularization of
source tissues such as aorta, (Kumar et al., 2010; Kumar et al., 2012a,b; Kumar et al., 2013a,b), dermis (Gangwar et al., 2006; Gangwar et al., 2015; Kumar et al., 2013c,d), diaphragm (Singh et al., 2008), pericardium (Singh et al., 2014), small intestine (Kumar et al., 2013e; Kumar et al., 2014) and swim bladder (Kumar et al., 2013f; Kumar et al., 2015b). Inadequate decellularization of the source tissue results in retained cellular antigens within the ECM. Those cellular antigens are recognized as foreign by the host and elicit proinflammatory response or overt immune-mediated rejection of the tissue (Gock et al., 2004). The effective removal of antigenic epitopes associated with cell membranes and intracellular components of tissues is necessary to minimize or avoid an adverse immunologic response by xenogenic recipients (Xu et al., 2008; Brown et al., 2009). Therefore, decellularization process is critical determinant of clinical success (Burch et al., 2010). The ideal decellularization technique removes cells and cellular remnants leaving behind acellular ECM scaffold which can retain the original collagen architecture intact (Deeken et al., 2010). Decellularization of source tissue is most commonly assessed by quantification of remnant DNA. Fourier-transform infrared (FTIR) spectroscopy is another tool for investigation of chemical compounds and shown potential for qualitative and quantitative analysis of biological samples (Makhnii et al., 2016).

Present study was performed with under mentioned objectives:
1. To standardize preparation of decellularized aortic and diaphragmatic matrices of buffalo origin.
2. To evaluate biocompatibility of prepared matrices for the repair of clinical abdominal hernias in cattle.