countries of Europe in 2014 (Jones-Dias et al. 2016). The antibiotic administration has decreased by 6% in the last seven years but, in the last 12 months, a third of Europeans have taken antibiotics (Comission 2014). There are also reported 120 million cases of community-acquired urinary tract infections (UTI) and 868 mil sepsis-associated mortalities due to *E. coli* worldwide per year (Wu et al. 2013). *Escherichia coli* strains might act as reservoirs of antibacterial-resistant genes that could be a main public health concern (Frye and Jackson 2013).

Thus, a key indicator of environmental contamination caused by the growing of antimicrobial-resistant bacteria can be different in animal species like companion animals (Seni et al. 2016), donkeys (Carvalho et al. 2017), swine (Herskin et al. 2016), equines (Moura et al. 2013), wild animals like Iberian lynx (Gonçalves et al. 2014), and birds (Radhouani et al. 2012).

For example, a research done by Huiting (2015) with broilers from farms in Morocco showed higher rates of AMR for colistin (3% resistant), gentamicin (25% resistant), florfenicol (51% resistant), trimethoprim–sulfamethoxazole (68% resistant), enrofloxacin (87% resistant), amoxicillin (75% resistant), and doxycycline (100% resistant). The data is similar with Spain and the United Kingdom (Shaikh et al. 2015). One possible explanation, according to Cohen et al. (2007), is the very low rate of healthcare in different shops in Morocco.

Another study with equine fecal *E. coli* isolates from two livery stables in North West England showed high tetracycline-resistant rate (Ahmed et al. 2010).

11.4.2 *Klebsiella pneumoniae*

Klebsiella pneumoniae is a saprophyte in humans and other mammals. This type of enterobacteria colonizes the GI tract, skin, and nasopharynx, but it can be also found in different environmental niches, such as water, soil, vegetables, fruits, cereals, and fecal samples (Cristina et al. 2016).

MDR *K. pneumoniae* is one of the global causes of nosocomial and life-threatening infections and it is responsible for roughly 15% of Gram-negative infections in hospital ICUs (Onori et al. 2015). It is an important causative agent responsible for pneumonia and UTIs but can also cause liver abscess and intra-abdominal infections, particularly in hospitalized immunosuppressed patients (Lederman and Crum 2005; Tzouvelekis et al. 2012).

In the early 1970s, high levels of *K. pneumoniae* were detected in patient's nasopharynges and it became an important cause of nosocomial infections. At the end of the twentieth century and beginning of the twenty-first, due to migration and travel of persons all around the world, these strains had increased speed and widened areas of colonization. They also become a "collector" of successive addition of genetic elements encoding resistance to aminoglycosides and extended-spectrum lactams (Bengtsson-Palme et al. 2015; Karanika et al. 2016).