	Netherlands	India	Ethiopia	Uganda
Number of cattle	1,6 million dairy cows	Cattle population 199 million, 62.4 million dairy cows, 105 million buffaloes.	Cattle population 52 million, 10.5 million dairy cows	Cattle population 14.4 Million 1.5 million dairy cows
Annual production	8,210 kg milk /year between 20-40 litres/day	Local cattle breeds (77 %) 2,1 kg/day Crossbreeds 6-8 kg/day	305 liters/year	2 billion liters of milk/ year. with indigenous cattle contributing 75% of the production. average for Ankole is 3litres/day. Crossbreeds give 5-7 liters per day.
Dairy farming system	Specialized dairy, average 85 cows/farm	Majority of smallholder integrated farms, with 2-3 dairy cows	Pastoralist system: lowland grazing meat/milk system based on local breed; mixed crop-livestock systems heavily dependent on grazing(small holder grazing with local cattle and cross breds); intensive dairy farming in higher regions	Pastoralist in the cattle corridor, communal grazing in Northern and Eastern Uganda, paddocking in the Western Uganda and zero grazing in the peri-urban areas.

Cattle Health problems	Infectious endemic diseases controlled Mastitis Infertility Lameness Metabolic disorders Calf scour	Infectious endemic diseases (e.g. FMD) Mastitis Bloat Calf scour Infertility FMD Enteritis Post-partum complications (especially cross breeds) Udder pox Maggot wounds	Infectious endemic viral and tick-borne diseases (e.g. FMD, CBPP) Pneumonia Mastitis Lameness Infertility	Infectious endemic viral and tick borne diseases (e.g. East Coast fever) Mastitis Infertility FMD CBPP LUMPY SKIN DISEASE Metabolic diseases Hardware disease in zero grazing
Data on antibiotic use and resistance	Farmers keep record of their antibiotic use LEI Wageningen UR monitors the antibiotic use per animal species	Govt of India Food Safety & Standard Act (2006) prohibits residues in food – lack of implementation	Very limited information available; limited data and systematic surveillance; limited laboratory capacity	AMR in humans recognized as problem Limited awareness of problem of antibiotic use in cattle; limited data and systematic surveillance;

	FIDIN, the federation of the Dutch veterinary pharmaceutical industry, annually reports the overall sales of antibiotics Animal Drug Authority collects data Maran reports on use of antibiotics and resistance Establishment of Animal Daily Doses (ADD) per year			limited laboratory capacity

Measures to protect the environ-ment	Rules on the maximum amount of manure/fertilizer to be applied Requirements to minimize NH_3-emmission	Biodiversity regulations	No data	National drug act that gives guidelines on the use of antibiotics. The document is in place but implementation is lacking Dairy Development Authority periodically tests milk for adulteration and residues. National Environmental Management Authority(NEMA) asses environmental impact assessment
Methods to reduce the use of antibiotics	National programs on udder health and cow resilience Farm health management program Restriction on the use of certain antibiotics	Training of veterinarians and farmers on use of ethno- veterinary medicine (to limited extent) Promote organic dairy farming	None	None

	Stable books with info on herbal treatments Organic farming			
Environ-mental problems	Lack of biodiversity in pasture Reduction/disappearance of insects, birds, soil life Lack of biodiversity in soil Obligatory injection of manure in soil MRSA and ESBL in surface water Pollution of ground and surface water	High levels of residues in milk in the food chain, environment	Cow manure majorly used for cooking. Overgrazing in open access communal pastures	Residues of acaricides and veterinary medicine in environment Reduction/disappearance of insects, bees, butterflies, birds, soil life

Use of herbal medicine	Is increasing (48 % of farmers use herbal medicine)	Large databases on herbal medicine; Training of veterinarians and farmers on use of ethno- veterinary medicine	Documentation work done for specific pastoral region. More documentation and field verification needed; Ethiopian drug policy failed to address ethno veterinary practices and medicines	Pastoral knowledge on herbal medicine is declining
Breeding	Mainly HF, some local breeds Mostly HF since 1960's, trend to crossbreeds back with local or European dual purpose breeds to increase robustness	Mainly HF to pure breed crossbreed cattle Loss of 50% of local breeds Systematic crossbreeding mainly with HF and some Jersey since 1964	Total 32 local breeds, HF crossbreeds Crossbreeding with HF and Jersey since 1990's Community based breeding program initiated and in progress	93.6% of cattle local breeds (e.g. Ankole), Crossbreeding with HF, Jersey, Guernsey and Ayrshire is increasing
Milk control	Strictly regulated by Qlip At farm-level 0.016% of the tested samples positive on antibiotic residues	Control on residues of veterinary drugs at level of milk factory is lacking at community milk collection centers Lack of enforcement	No stringent regulation structure in place; Lack of control on residues of veterinary drugs	Regulated by Dairy Development Authority(DDA),Very low enforcement. Building capacity for milk testing at every milk collection center

Develop-ments	Antibiotic reduction strategy developed between ministries of health, agriculture and environment	National Dairy Development Plan Intensive Dairy Development Program, Strengthening Infrastructure for Quality and Clean Milk Production, Assistance to Cooperatives Dairy Entrepreneurship development Scheme.	Dairy development programs Growth and Transformation Plan	Dairy industry Act and Stature for Dairy is guiding dairy development Dairy development authority
Needs	Need to develop suitable methods of enforcement of antibiotic reduction Knowledge of preventive animal health care and alternative (herbal) medicine Research and	Need to develop suitable methods of enforcement of antibiotic reduction and controlled antibiotic sales and use by unauthorized practitioners Milk control on residues at community dairy collection centre Develop programme for	Include herbal medicines as a means to reduce synthetic antibiotic use. Improve productivity of local breeds (feeding, selection) Test systems for antibiotics in milk Evaluate local indigenous knowledge in ethno veterinary medicine to	Herd Nutrition and water for production Improvement in Animal Breeds and genetics Analysis of drug potency, use and residues in animal products Herbal Medicine revitalization Capacity Building for Scientists in adaptive

	substantiation of the working of herbal medicine New breeding goals aiming at improving cow health, welfare, fertility and longevity Development of a premium on milk that is produced without antibiotics	awareness and training for farmers and the other stakeholders	develop herbal medicines for dairy cattle Breeding programs for local breeds that are more resistant to diseases	research and innovations Establishment of field milk testing sites Building capacity of stakeholders along the milk values chain in proper milk handling and quality control. Development of quality based payment systems of milk.