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Burkina Faso:
Animal-Source Food Production and Marketing

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This brief is a work in progress. It will be updated with additional information collected in the future.

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Sustainably intensifying smallholder livestock systems to improve human nutrition, health, and incomes

1. Introduction

Burkina Faso has seen its livestock numbers increase between 2% (goats, sheep, and chickens) and 3% (cattle, pigs) annually from 2005 to 2014. The number of goats exceed 13.8 million head, followed by sheep at 9.3 million, cattle at over 9.1 million, and pigs at 2.3 million. The national camel herd is only about 18,000 animals. Of these animals, women raise goats more than men do, while principally men raise the others. Chickens are by far the most common domestic animal, 33.7 million, though guinea fowl are also numerous at 8.4 million. Women manage 70% of poultry of which more than half (60%) is also marketed by women, principally in local markets. Egg production doubled from 2012-2014, to over 120,000, though only 10% of eggs are sold (MRA, 2007a; 2015; CRS, 2014b; INERA, 2015). The Sahel region has the largest number of cattle, goats, sheep, and camels; while Centre-Ouest region has the largest number of pigs, chickens and guinea fowl (Figure 1).

Table 1: Livestock numbers by region in 2014, thousands (MRA, 2015).

Region	Cattle	Goats	Sheep	Pigs	Chickens	Guinea fowl
Boucle du Mouhoun	803	1195	761	271	4163	1115
Cascades	676	226	236	53	884	324
Centre	156	338	224	186	1330	196
Centre-Est	427	1073	731	218	2793	521
Centre-Nord	512	1280	1027	76	2436	296
Centre-Ouest	706	1684	1032	457	4898	2120
Centre-Sud	318	756	400	125	2534	871
Est	1034	1470	950	130	2535	445
Hauts-Bassins	1509	813	850	265	4226	896
Nord	415	1246	921	136	2868	588
Plateau Central	324	861	577	113	2071	280
Sahel	1868	2329	1301	4	1383	225
Sud-Ouest	343	620	268	312	1632	591

Based on research in the country, by the Institute for agricultural and environmental research (INERA) and the Food and Agricultural organization of the United Nations (FAO) and other institutions have published extensively on ways to improve the productivity of livestock in Burkina Faso. This brief summarizes information on production systems, forages and feeds, markets, processing, and genetic improvement.

2. Production Systems

The Ministry of Livestock Resources (MRA, 2007b; 2011a; 2011b) categorizes livestock production systems as traditional extensive or commercial, with numerous sub-categories, most of which combine multiple livestock species.

2.1 Traditional extensive production systems

a. Transhumant production systems (9% of livestock producers, 16% of cattle and 6% of goats and sheep) are operated mainly by Peulh pastoralists, within Burkina Faso but also extending north to and from Mali and Niger, and extending south to the coastal

countries. Average herd size is 60 animals and the Sudanese Peulh zebu breed is favored. In Boucle du Mouhoun and East Sahel, transhumant herds of sheep and goats (Peulh, Gourmantché, Bella races) are also found. Transhumance is either long-distance, > 100 km, or short distance. Livestock in this system depends on natural pastures, and there is no integration with crop production, except that herds use fields post-harvest feeding on the crop residues. Livestock receive little or no management inputs: shelter, minerals, or feed supplements. Only lactating animals may be supplemented in the dry season. Forage is rarely produced or stored. Livestock also depend on surface water only, and face difficulties in the dry season. Other challenges for transhumance systems are the conversion of natural pasture lands and transhumance corridors to crops, lack of secure land and resource tenure, and conflicts with farmers (Kagoné, 2001; MRA, 2007b; 2011a; 2011b; Diallo & Boundaogo, 2011; FAO, 2012; Traore, 2012).

b. Sedentary extensive systems (within one day's walk). Today these are the predominant production systems in Burkina Faso, practiced by 85% of livestock producers (including 79% of cattle, 91% of goats and sheep, 92% of pigs and camels, and 98% of chickens and guinea fowl) (MRA, 2011a; 2011b; Guissou et al., 2013).
    i. Agro-pastoral sedentary systems are used to convert crop surplus to livestock. These are widely practiced by most ethnic groups and by white-collar workers. One version involves sedentary cattle raising away from crops, using natural pastures, while the other integrated system keeps animals with crops (traction cattle / donkeys / horses as well as sheep / goats). In these systems livestock benefit from dry-season feeding of crop residues and brans (MRA, 2007b; Diallo & Boundaogo, 2011). Poultry are kept in mixed flocks of up to 15 birds, with no to minimal surveillance, little management of reproduction, only rudimentary shelter, and vaccination, though some water and supplementary feed are provided (MRA, 2007a).
    ii. Urban and peri-urban sedentary systems are practiced by residents of Ouagadougou and Bobo-Dioulasso who raise goats, sheep, cows, and chickens. Animals are pastured year-round in open city spaces, as well as on fallows and rangelands at the cities' edges. Owners also produce forage for livestock, and provide supplemental feed such as brewery wastes or cottonseed cakes for ruminants, and cereal grains and brans for poultry. Manure is provided as compensation (not sold) to owners of crop fields where animals forage, and sometimes is used in family gardens. Most animals are vaccinated and de-parasitized, but reproduction is not managed. Herd size averages 8 goats and sheep (Diallo & Boudaogo, 2011; Kaboré et al., 2011; Amadou et al., 2012; FAO, 2012; Dossa et al., 2015; Gnanda et al., 2016). Poultry flocks can be up to 50 birds and production is for income. Sturdy and clean shelters are provided, as are water and feed (MRA, 2007a).

2.2 Commercial semi-intensive or intensive production systems

a. Cattle fattening and milk production
    i. Family cattle fattening operations handle up to three animals at a time, providing several types of feed and mineral supplements: agro-industrial byproducts (cottonseed or other), grain straw, natural forages, salt. Principally men

undertake cattle fattening, and animals are sold in local markets (MRA, 2007b; Diallo & Boundaogo, 2011; Traore, 2012; CRS, 2014a; 2014b).

ii. Commercial fattening and milk production systems around Ouagadougou and Bobo-Dioulasso are operated by civil servants, traders or private companies. They use native cattle breeds (Peulh, Goudali and Azawak) as well as cross-breeding of these or with exotics. Operators produce their own forages, cut and dry natural forages, and purchase crop residues and agro-industrial by products as well as mineral supplements. They provide good veterinary care and utilize artificial insemination techniques. Fattening operations handle 10-100 animals at a time (Hamadou & Sanon, 2005; Diallo & Boundaogo, 2011; Sanon et al., 2014).

b. Sheep fattening
Goat fattening is less common because market demand is low (CRS, 2014a)

i. Family sheep fattening is principally done by women—using Bali Bali, Djallonké or mixed-breed sheep—up to five animals at a time. Animals are sold principally in local markets. Sheep receive a variety of feeds including cowpea and peanut greens, grain straw, natural forages, cottonseed, local bran (MRA, 2007b; Diallo & Boundaogo, 2011; Traore, 2012; CRS, 2014a; 2014b).

ii. Commercial sheep fattening is undertaken by traders, and more recently by women's groups sponsored by NGOs or government projects (MRA, 2007b).

c. Other semi-intensive and intensive production systems include all pigs in Burkina Faso, and are increasing for poultry and milk production to meet growing demand. These are located near urban areas and are operated by civil servants and entrepreneurs (MRA, 2011a).

3. Milk Production

Milk production was traditionally the responsibility of women, (and especially the Peulh, Mossi, Tuareg and Maure pastoralist peoples), and their principal income source, but with livestock further from residences and with government and project interventions, men have taken over milk marketing and income (Hamadou & Sanon, 2005). Although productivity is very low—0.5-2.0 liters per cow, dairy products contribute on average 32% of farm income, and are important in each of the livestock management systems described above: transhumant, sedentary extensive, and semi-intensive to intensive (FAO, 2012). Numbers of milk transformation units (UTL) have fluctuated between 100 and 200 from 2007-2014, with the highest numbers in Centre and Hauts Bassins Regions, where urban demand is highest from Ouagadougou and Bobo-Dioulasso respectively; as well as in Sahel Region where cattle, goats and sheep are most abundant. Milk production has likewise fluctuated over the same period, exceeding 3.5 million liters of processed milk in 2014, with nearly half the production in Hauts-Bassins Region alone (MRA, 2015). The Islamic Development Bank is financing from 2014-2018 the implementation of the Société de Production de Lait (SOPROLAIT), with an expected production capacity of 30,000 liters of UHD milk per year (Traore, 2012).

4. Feeds and Forages

Overall, insufficient and poor quality forage and feed limit productivity. The livestock production systems described above depend very heavily on natural pastures (fresh grasses, and some woody vegetation in the dry season) for ruminants and on local products (household waste but also cereal grains and brans) for pigs and poultry (Table 2, Appendices 1-3). Cultivated forages are virtually absent, though FAO has been promoting them since at least 1950 (Kagoné, 2001; Guissou et al., 2013). Markets in urban areas do supply forage products, generally natural forages or crop residues, at least on a seasonal basis (Kaboré et al., 2012; Tamini et al., 2014). However, commercialization is limited by the lack of transport and storage facilities, difficulties with drying natural forage, bush fires, and the distance to harvest sites (Tamini et al., 2014). Forage collection methods, often taking the entire plant, can denude the landscape, while feed quality is poor under rudimentary processing (silage or urea treatment is rare) and storage methods that rarely enclose or shade the fodder (CRS, 2014a; ILRI & CGIAR, 2015). Natural forages are also declining as pastoral lands are converted to crops (INERA, 2015), yet crop residues (rice / millet / sorghum / maize straws, peanut / Bambara groundnut / cowpea greens) remain underutilized (Kagoné, 2001; MRA, 2007b; Traore, 2012; Sanon & Traore, 2014; Sanon et al., 2014; Gnanda et al., 2016). In order to increase forage production, INERA is producing seed for forage crops, which MRA provides to livestock producers at a subsidized rate (80% of actual cost), together with forage harvesting equipment (ILRI & CGIAR, 2015).

More than 50 small private producers now supply agro-industrial byproducts, mainly cottonseed cakes and cereal brans, while several large private or public-private companies (MINOFA, SN CITEC, SOFAB, ICO, SOBA, SOFITEX, GMB, SN SOSUCO, Unité ASUDEC, LAPHAVET, CPAVI, Genol BF, SOFIB Huilerie) produce more elaborate feeds. Cotton grain, molasses, and brewery waste are also utilized (Sanon et al., 2014). However, their high cost limits them to urban and peri-urban production systems and intensive livestock operations such as the fattening systems (Diallo & Boundaogo, 2011; Amadou et al., 2012; Traore, 2012; CRS, 2014a; 2014b; Sanon & Traore, 2014; Sanon et al., 2014; INERA, 2015). MRA is making them available at a subsidized rate (30% of actual cost) (ILRI & CGIAR, 2015). Only SOFAB (Société de Fabrique d'Aliment pour Bétail) markets a formula specific to goats and sheep (Tamini et al., 2014). SOFAB alone has a production capacity of 100,000 tons of feed per year so overall supply of agro-industrial byproducts should not be a limitation (Traore, 2012).

Table 2: Principal food sources by species (%) (MRA, 2011a).

	Natural pasture	Agro-industrial byproducts	Crop residues	Cultivated forages	Hay	Local products
Cattle	83	2	12	<1	<1	2
Sheep	80	2	15	<1	<1	3
Goats	84	1	12	<1	<1	2
Pigs	9	2	4	<1	3	81
Camels	51	49	<1	0	0	<1
Chickens	0	<1	6	<1	0	93
Guinea fowl	0	<1	5	0	<1	95

5. Exports and Marketing

In terms of ASF, Burkina Faso exports about 10 times the value of what it imports, and over 90% of imports are milk products (MRA 2011b). Burkina Faso is a major exporter of livestock, particularly to its coastal neighbors to the south. Côte d'Ivoire is the most important destination for sheep and chickens, while Ghana is for goats, and Nigeria is for cattle. Important numbers of ruminants are also exported to Niger. Some meat is exported—peaking at 11 million CFA francs in 2010 but declining to less than 2 million in 2012. But most exports are live animals: 500,000 sheep, 400,000 goats, 340,000 cattle, and 300,000 chickens; with cattle representing 80% of the 5.2 billion CFA in 2011 earnings. Ninety-five percent of meat exports, 142,000 kg in 2012, are to Côte d'Ivoire and to Gabon (MRA, 2015).

Three categories of internal livestock markets operate in Burkina Faso (MRA, 2007b; Traore, 2012; Guissou et al., 2013; Tamini et al., 2014):

1. Production or primary collection markets in the rural areas where livestock is raised and where herders sell 1-2 animals at a time, with no livestock handling infrastructure (water sources, corrals, scales). Intermediary buyers build up herds for transfer to other markets, moving the animals on foot or by truck.

2. Redistribution markets are medium-sized markets in towns on transit corridors; some are traditional with no infrastructure for handling livestock, some are modern with corrals and truck loading chutes.

3. Final or export markets in Ouagadougou and Bobo Dioulasso are big modern markets with abattoirs, cold storage, exporters, and butchers.

6. Processing

The MRA recognizes nearly 400 "controlled" abattoirs and abattoirs-dryers around the country, where licensed inspectors certify animal handling procedures for 1200 goats, 400 sheep, 250 cattle, and 180 pigs slaughtered annually in these legal facilities (MRA 2015). Only three abattoirs have cold-storage capabilities (Ouagadougou, Bobo-Dioulasso, Dédougou), and few of the others meet international hygiene standards. Many other animals of these species, and all poultry, are slaughtered at home or in non-certified abattoirs, representing fully two-thirds of meat consumed in Burkina Faso (MRA, 2007a; Traore 2012; Fadiga & Fall, 2014; Tamini et al., 2014; ILRI & CGIAR, 2015).

In turn, virtually all meat is consumed fresh, sold directly to consumers, to meat-grillers, and to restaurants. Only two modern meat-processing plants operate, in Ouagadougou and Bobo-Dioulasso respectively (MRA, 2007b; Tamini et al., 2014; IRI & CGIAR, 2015).

7. Genetic Improvement

Although they are resistant to local diseases and environmental conditions, native breeds are low in productivity (MRA, 2007b). In northern Burkina Faso, the larger Peulh or Sahel sheep and goat breeds predominate, and in the south and center of the country the smaller Djallonké and Mossi breeds or cross-breeds (Tamini et al., 2014). The four principal local breeds of chickens are Peulh, Dori, Kondé, and Central Burkina Faso gray (MRA, 2007a).

Various initiatives for genetic improvement have been undertaken, but lacking overall coordination and at very small scales. The positive features of local breeds, including disease resistance and adaptation to local environmental conditions, could also be lost or diluted by exotic breeds (Tamini et al., 2014). The International Atomic Energy Agency is financing the project BKF5014 "Improving the Productivity of Small Ruminants through Diet, Health and Identification of Genetic Markers for Selection and Breeding Management" from 2014-2017. The objective of the project is "**t**o contribute to improving the productivity and profitability of small ruminant farms in Burkina Faso by applying genetic characterization and artificial insemination for breeding and utilizing local feed resources to improve nutrition and medicinal plants to control parasites" (https://www.iaea.org/projects/tc/bkf5014). The government of Luxembourg is also financing the project BKF/017, "Support for the dissemination of the Azawak Zebu", to improve the productivity of this local cattle breed (https://luxdev.lu/en/activities/project/BKF/017).

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Appendix 1. Forage species by agro-ecological zone (Kagoné, 2001).

Agro-ecological zones (annual rainfall)	Grasses: Native and Cultivated	Legumes: Native and Cultivated
Sahel (< 400 mm)	*Andropogon gayanus* *Cenchrus ciliaris cv. Biloela* *Cenchrus ciliaris cv. Gayndah* *Pennisetum pedicellatum*	*Alysicarpus ovalifolius* *Macroptilium atropurpureum* *Macroptilium lathyroïdes* Cultivated: *Stylosanthes hamata* Forage cowpea
Sub-Sahel (400–600 mm)	*Andropogon gayanus* *Pennisetum pedicellatum* Cultivated: Forage sorghum Forage maize	*Alysicarpus ovalifolius* *Lablab niger* *Macroptilium atropurpureum* *Mucuna sp.* Cultivated: Forage cowpea
North-Sudan (600–900 mm)	*Andropogon gayanus* *Panicum maximum* *Pennisetum pedicellatum* *Rottboellia exaltata* Cultivated: Forage sorghum	*Aeschynomene histrix* *Crotalaria intermedia* *Crotalaria juncea* *Lablab niger* *Mucuna sp.* *Mucuna pruriens cv utilis* Cultivated: *Stylosanthes gracilis* *Stylosanthes guianensis* Forage cowpea
South-Sudan (> 900 mm)	*Andropogon gayanus* *Brachiaria ruziziensis* *Cenchrus ciliaris cv. Biloela* *Chloris gayana* *Echinochloa stagnina* *Melinis minutiflora* *Panicum maximum* *Pennisetum purpureum cv Napier* Cultivated: Forage sorghum Forage maize	*Aeschynomene histrix* *Cajanus cajan* *Centrosema spp. Dol* *Lablab niger* *Neonotonia wightii* *Macroptilium artropurpureum* *Macroptilium lathyroïdes* *Mucuna sp.* *Phaseolus aureus* Cultivated: *Stylosanthes hamata cv Verano* *Stylosanthes guianensis*

Appendix 2: Other Native Forages (Kagoné, 2001; ILRI & CGIAR, 2015).

Grasses	Legumes	Other
Acroceras amplectens	*Acacia ehenbergiana, A. laeta, A.*	*Adansonia digitata*
Andropogon pseudacpricus	*nilotica, A. raddiana, A. senegal, A.*	*Aerva javanica*
Anogeissus leiocarpus	*seyal*	*Balanites aegyptiaca*
Aristida mutabilis, A. hordaceae, A.	*Afzelia africana*	*Boerhavia erecta*
kerstingii, A. adscensionis	*Bauhinia rufescens*	*Butyrospermum*
Burkea africana	*Cassia obtusifolia*	*paradoxum*
Butyrospermum paradoxum	*Dolichos lablab*	*Combretum glutinosum*
Cenchrus biflorus, C. prieurii	*Indigofera aspera*	*Evolvulus alsinoides*
Cymbopogon schoenanthus	*Isoberlinia doka*	*Gardenia tenuifolia Kyaha*
Dactyloctenium aegyptium	*Molluga nudicaulis*	*senegalensis*
Digitaria horizontalis	*Parkia biglobosa*	*Limeum viscosum, L.*
Diheteropogon hagerupii	*Piliostigma reticulatum*	*pterocarpum*
Echinocloa pyramidalis	*Pterocarpus erinaceus, P. lucens*	*Terminalia avicennioides,*
Eragrostis tremuula	*Tamarindus indica*	*T. macroptera*
Hyparrhenia cyanescens	*Zornia glochidiata*	*Tribulus terrestris*
Imperata cylindrica		
Loudetia togoensis		
Loudetiopsis scaettae		
Mitragyna inermis		
Oryza barthii		
Panicum anabaptistum, P. laetum		
Schiizachyrium exile, S. sanguineum, S.		
brevifolium		
Schoenefeldia gracilis		
Vetiveria nigritana		

Appendix 3: Principal feed sources for small ruminants (INERA, 2015).

Natural pasture	**Cultivated forage**	**Purchased feed**
Grasses		
Andropogon gayanus	Cowpea greens	Cottonseed cakes
Eragrostis tremula	Peanut greens	Cotton seeds
Loudetia togoensis	Sorghum / millet / maize stalks	Corn bran
Pennisetum pedicellatum	Hibiscus stalks	Sorghum stalks
Shoenfeletia gracilis	Sweet potato leaves	Native grass (dry)
Legumes	Mucuna	Cubed bran
Acacia nilotica, A. albida, A. seyal, A. machrostachyn, A. ataxaeanta	Rice straw	Rice straw
Alisicarpus ovalifolices		
Afzelia africana		
Bauhinia rufescens		
Cassia sieberiana		
Eichrostachys glomerata		
Zornia glachidiata		
Other		
Adansonia digitata		
Anogeisus leiocarpus		
Combretum aculeatum		
Dalbergia sissoo		
Grewia bicolor, G. molle		
Ipomoea oocarpa		
Kyaha senegalensis		
Lannea microcarpa, L. acida		
Securinega virosa		
Ziziphus mauritiana		