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# Rapid integrated assessment of nutrition and health risks associated with the small ruminants value chain in Senegal

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# Outline of presentation

- **Background**
- **Methods**
- **Results**
- **Conclusion and recommendation**
- **Acknowledgements**

# Background

- Populations of pastoral societies consume a variety of foods. These products may be of animal or vegetable origin or manufactured goods
- They have several products of animal origin which come most often from their own farms or at least available in their immediate surroundings
- The issue of food related public health is managed by Government bodies.
- There is an insufficient effectiveness of services organization and a weak participation of citizens in the food related public health activities.

# Background

- There is sometimes interdepartmental competence conflicts in management of inspection activities (Ministry fisheries and animal husbandary, Ministry of trade, Ministry of tourism, Ministry of Health, District), especially in Côte d'Ivoire.
- In Côte d'Ivoire there is an absence of implementing order for the law 96-563 of 25 July 1996 related to the health inspection of animal source food
- The situation of food related public health of animal origin is very alarming and needs a permanent attention, in the form of technical and financial support, of continuous sensitization campaigns in order to improve hygiene conditions, especially in Mali.

# Background

- In Senegal there are several organisations for the protection of consumers :
  - ✓ Association des consommateurs du Sénégal (ASCOTEN)
  - ✓ Association sénégalaise de défense de l'environnement et des consommateurs (ASDEC)
  - ✓ Association pour la défense de l'environnement et des consommateurs (ADEC)
  - ✓ Union nationale des consommateurs du Sénégal (UNCS)
  - ✓ SOS consommateurs
- A network of nine associations takes part in the promotion of food and drinking water quality in Mali
- In Mali, Côte d'Ivoire and Senegal, consumers are poorly informed on the quality of food products of great consumption whereas street food becomes extensive, putting populations at risks.



# Background

- **The Government of Senegal has a directory of public and private laboratories:**

- ✓ **Private laboratories**

- Ecole supérieur polytechnique (ESP);
- Hygiène des denrées alimentaires d'origine animale (HIDAOA)
- Institut Pasteur de Dakar

- ✓ **Public laboratories**

- Institut de Technologie Alimentaire (ITA)
- Laboratoire national d'élevage et de recherche vétérinaires (LNERV)
- CERES LOCUSTOX

# Background

- Political commitment and awareness of nutrition is high. There are several program to support this commitment
- ✓ **A**dhésion à la Nouvelle alliance pour la sécurité alimentaire et la nutrition (Nasan)
- ✓ **P**lan REVA (Retour vers l'agriculture)
- ✓ **G**rande Offensive pour l'Agriculture, la Nutrition et l'Alimentation (GOANA)
- ✓ **P**rogramme national de développement local
- ✓ **P**rogramme de petite irrigation locale
- ✓ **P**rogramme des Services Agricoles et des Organisations des Producteurs (PSAOP)
- ✓ **P**rojet du Fond de Développement Social (PFDS)
- ✓ **P**rogramme d'Appui à la Réduction de la Pauvreté (PAREP) devenu PRP
- ✓ **P**rogramme de Soutien aux Initiatives de Développement Local (PSIDEL)
- ✓ **P**rogramme National de Développement Sanitaire et Social (PNDS)

# Methods

## □ Site identification

- **4 villages in Tambacounda (livestock remains extensive and based on large herds of cattle and / or small animals)**

- ✓ Missirah
- ✓ Gabou
- ✓ Kothiary
- ✓ Kouthiaba

- **4 villages in Dakar (semi-intensive farming)**

- ✓ Ngor
- ✓ Guediawane
- ✓ Tivaoune Peulh
- ✓ Malika

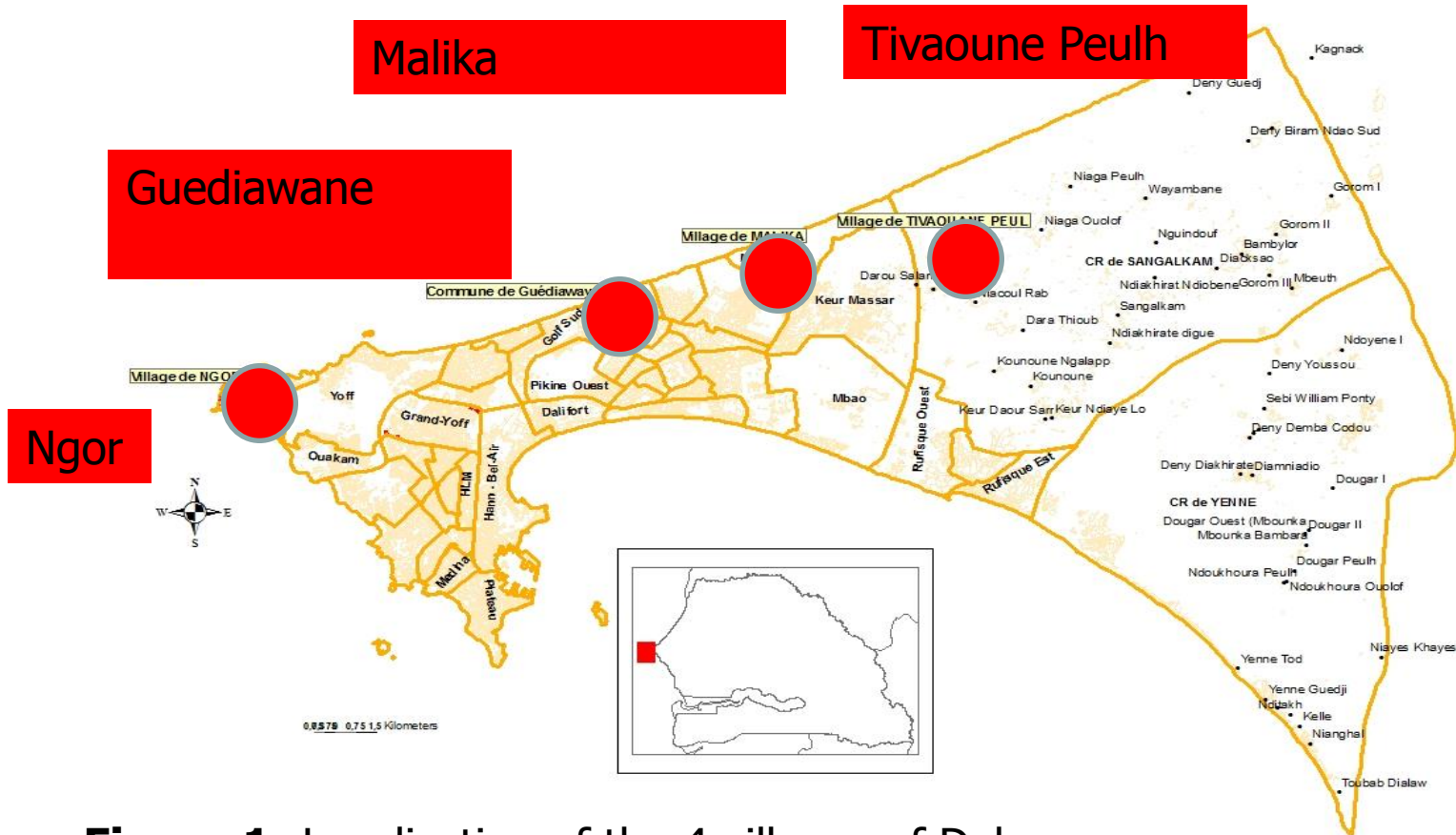


# Methods

## ❑ Criteria of selection of sites

- 8 villages selected in relation to:
  - ✓ Site of Tambacounda was chosen due to its proximity to Mali and also in relation to the size of his herd of small ruminants.
  - ✓ The site of Dakar was chosen with respect to its proportion of consumption of small ruminant meat.

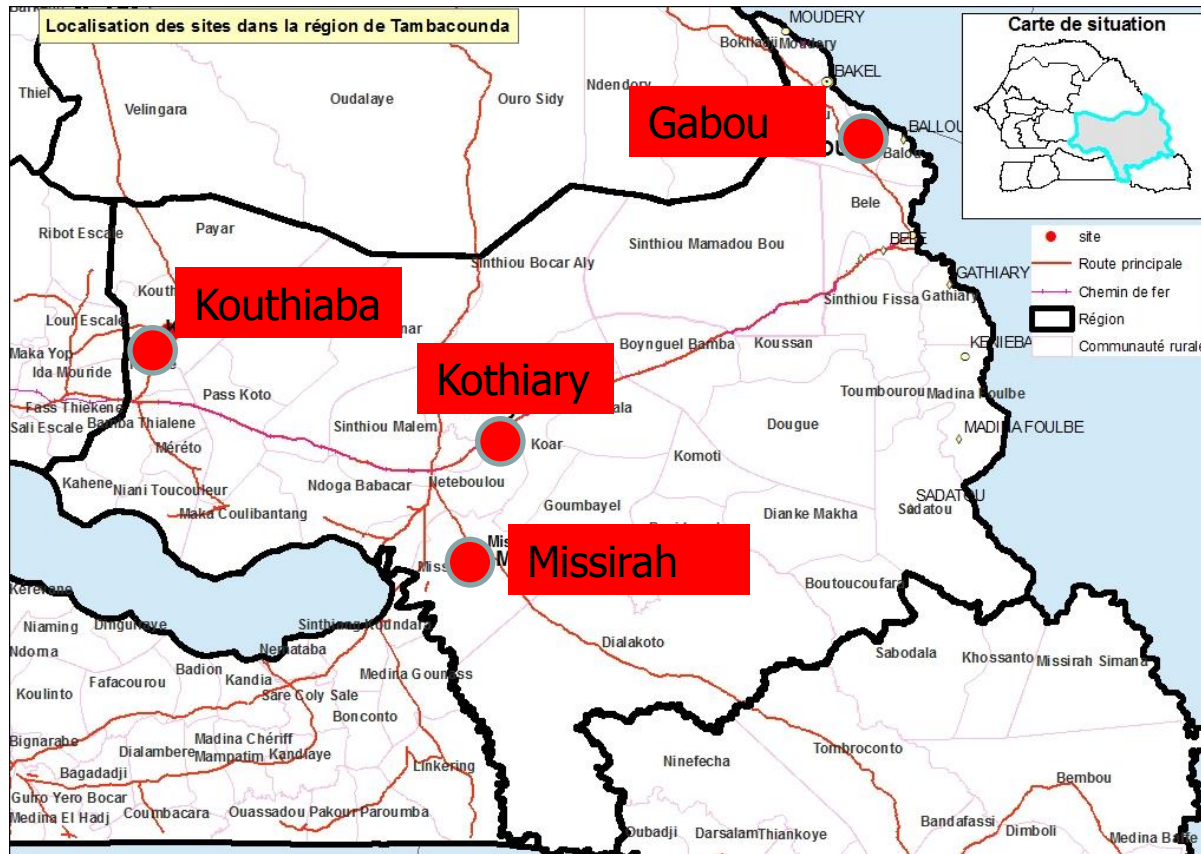
# Methods



**Figure 1:** Localization of the 4 villages of Dakar



# Methods



**Figure 2:** Localization of the 4 villages of Tambaounda

# Methods

## ❑ Ethical issues

- ✓ The sampling protocols were submitted to the ministry of Livestock of Senegal and an authorization (N° 1611) was obtained.
- ✓ Farmers were offered vitamins and dewormers for their animals as compensation for their time to participate in the survey

# Methods

## □ Data collection

- **Integrated rapid assessment included a qualitative assessment using participatory appraisals**
  - ✓ 8 RIA with consumers (6-8 consumers in each village)
  - ✓ 8 RIA with producers (6-8 producers in each village)
  - ✓ 8 Focus group discussions (6-12 women with children up to 5 years in each selected study communities)

# Methods



**Focus group discussion GD with women**

# Methods



**RIA with producers**

# Methods



**RIA with consumers**



# Methods

## ▪ Small ruminants' blood sampling

- ✓ Small ruminants' blood samples (n=384) were collected from households in Tambacounda and Dakar using a proportionate sampling taking into account the size of herds of small ruminants in each of 4 villages of Dakar and each 4 villages of Tambacounda.
- ✓ Sera were tested in competition ELISA (PPR) and EAT (buffered antigen test) + Fc: complement fixation (ovine brucellosis, *Brucella melitensis*).

# Methods



**Small ruminants' blood collection**

# Methods

## ▪ Raw and grilled meat sampling

- ✓ A cross-sectional study conducted in slaughterhouses of Dakar and Rufisque and in two slaughter in Dakar.
- ✓ Another cross-sectional conducted in 40 dibiteries out of 80 in by a simple random sampling using the list of dibiteries of Dakar provided by the ministry of livestock.

# Result

## □ Microbiological quality of raw meat in slaughterhouses and slaughter areas (n=20)

- ✓ The level of contamination of raw meat by fecal coliforms, *E.coli* and total aerobic mesophilic flora was acceptable
- ✓ The level of contamination of raw meat by for anaerobic sulfite reducing and *Staphylococcus* was satisfactory.

	Fecal coliforms	<i>E. coli</i>	Total aerobic mesophilic flora	Anaerobic sulfite reducing	<i>Staphylococcus</i>
Mean	34539.5	22464.75	6812705	91.5	32
Acceptable standards	5000<N<50000	5000<N<50000	1000000<N<10000000	100<N<1000	1000<N<10000
Categories	A	A	A	S	S

# Result

## □ Microbiological quality of grilled meat (n=120)

- ✓ Grilled meat contains a high number (unsatisfactory) of fecal coliform, *E. coli* and total mesophilic flora
- ✓ Level of contamination of grilled meat by sulphite -reducing anaerobes is acceptable and the level of contamination of grilled meat by *Staphylococci* is satisfactory.

	Fecal coliforms	<i>E. coli</i>	Total aerobic mesophilic flora	Anaerobic sulfite reducing	<i>Staphylococcus</i>
Mean	8609.80	3196.424	71269542	294.49	2.71
Acceptable standards	10<N<100	10<N<100	300000<N<3000000	30<N<300	100<N<1000
Categories	NS	NS	NS	A	S

# Result

## ❑ Zoonosis in small ruminants

### ✓ PPR (no zoonosis)

The overall prevalence was 72%.

### ✓ Brucellosis

The tests were performed with anti-antibody *Brucella melitensis* and we have not found a positive case of brucellosis.

# Result

## ▪ **Links between animal feeding and human food**

Farmers generally give to their animals, household food scraps such as couscous or rice that are popular in the region, but also peanuts, sugar, salt, and even made tea.

## ▪ **Relationship between livestock keeping and livestock eating**

- ✓ Animals are usually kept in the household to be sold for income. Part (especially sheep) is consumed during ceremonies and celebrations. Meat consumed in the household is usually beef bought in the market.
- ✓ Goat is generally rarely consumed. Cow's milk as opposed to small ruminants is a food that plays a vital role in the diet of children under 5 years and those 5 to 12 years and is recognized by consumers for its nutritional benefits especially for patients and children who are under 5.



# Result

## ▪ Risk management to food of animal origin

- ✓ The method of food preservation is related to the financial capacity of families.
- ✓ For some families, refrigerators and freezers can preserve foods and prevent them.
- ✓ Others use traditional methods which can be summarized in three steps: cooking, salting and drying.



# Result

## ▪ Role of animal foods in the diet of children

- ✓ The average weaning age for children is around 5 months to 2 years and not more than three years.
- ✓ At 10 months, children begin consuming foods other than breast milk.
- ✓ For meat, mothers begin by giving the liver when these children are not yet able to chew the flesh. Liver is supposed to enrich the blood and make corpulent children because of its texture