# 2008 KSU INSORTMIL/USAID Poultry Experiment in West Africa

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Kansas State University, Manhattan
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# Introduction

- INTSORMIL (funded by USAID) promotes the use and marketability of sorghum and millet in developing nations around the world
- A key objective is to provide technology transfer that will improve production, storage, marketing, and utilization of sorghum and millet
- An additional objective is to build human capital via student training and collaboration with colleagues in targeted regions of the world

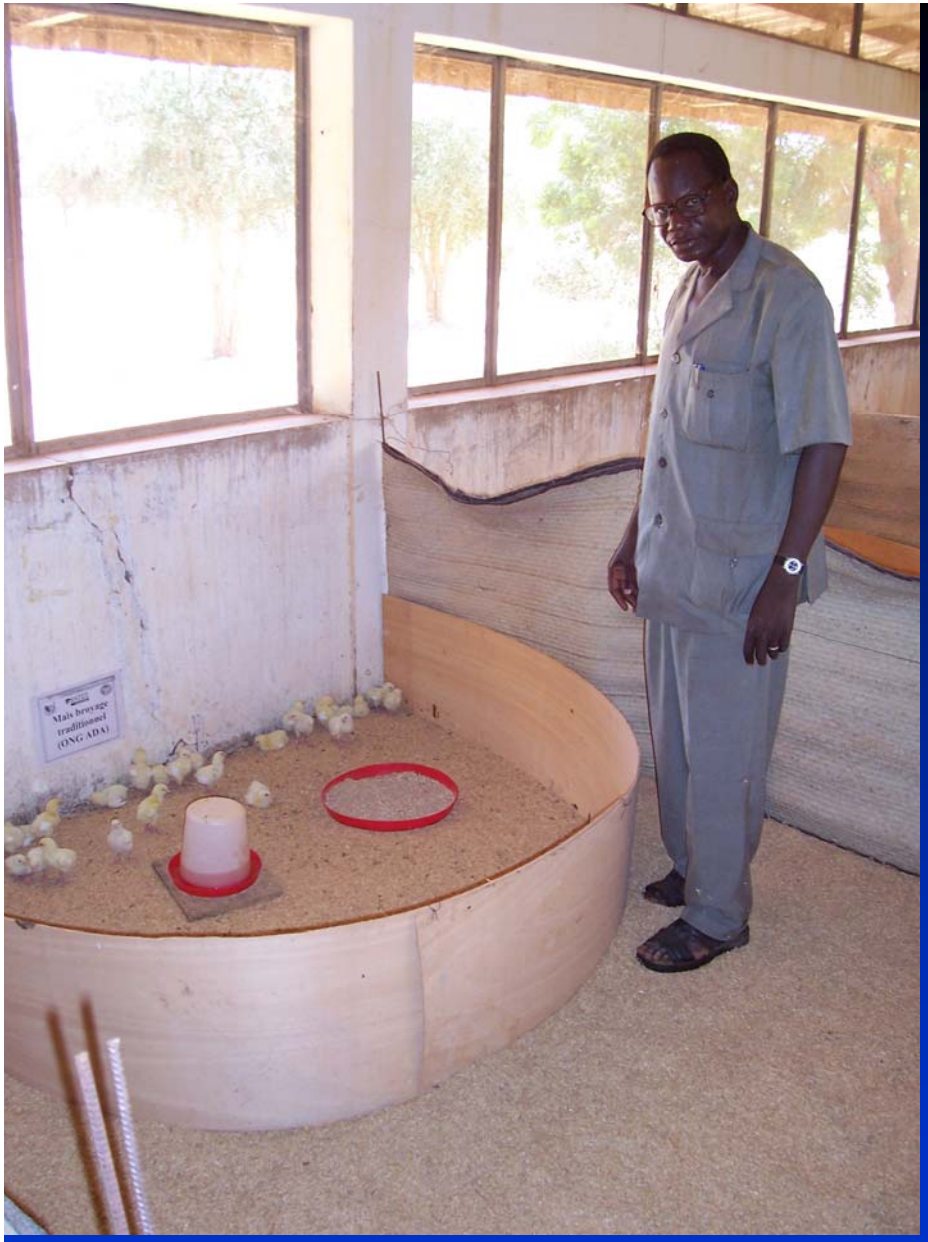
# Justification

- We were approached by potential collaborators from the National Institute for Agronomic Research in Niger (INRAN)
- Sorghum is the second most produced cereal (after millet) in Niger

- Locally produced sorghum is generally less expensive than imported corn, yet imported corn remains the main cereal used in poultry feed (Abdoulaye et al., 2006)

- It is well established that tannins have negative nutritional consequences in animals and humans and sorghum suffers from the image of necessarily having high tannin content
- Research at Kansas State University suggests that proper milling is even more important in sorghum-based than corn-based diets
- Hancock et al. (2000) proposed that adequate processing improved the nutritive value of sorghum in monogastrics to near that of corn

# Goudel Research Facility



## Chick feeding assay

- Corn
- Local sorghum
- Improved sorghum

## Broiler experiment

- 60 days experiment

## Layer experiment

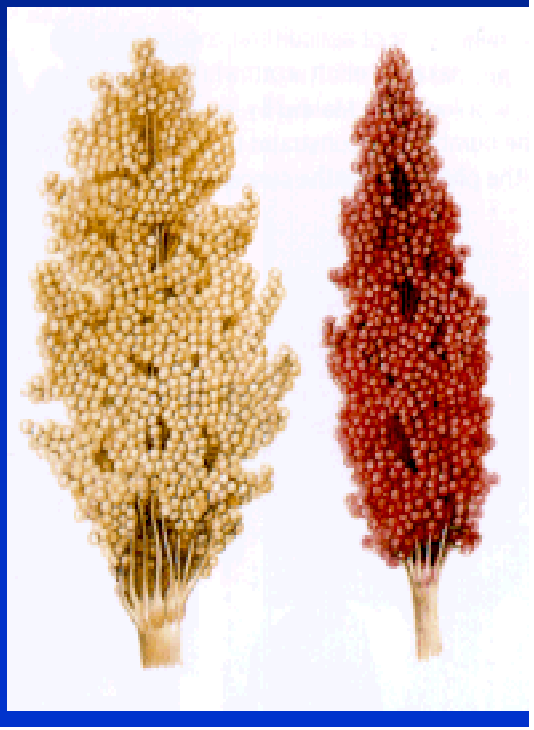
- 18 month experiment

# Objective

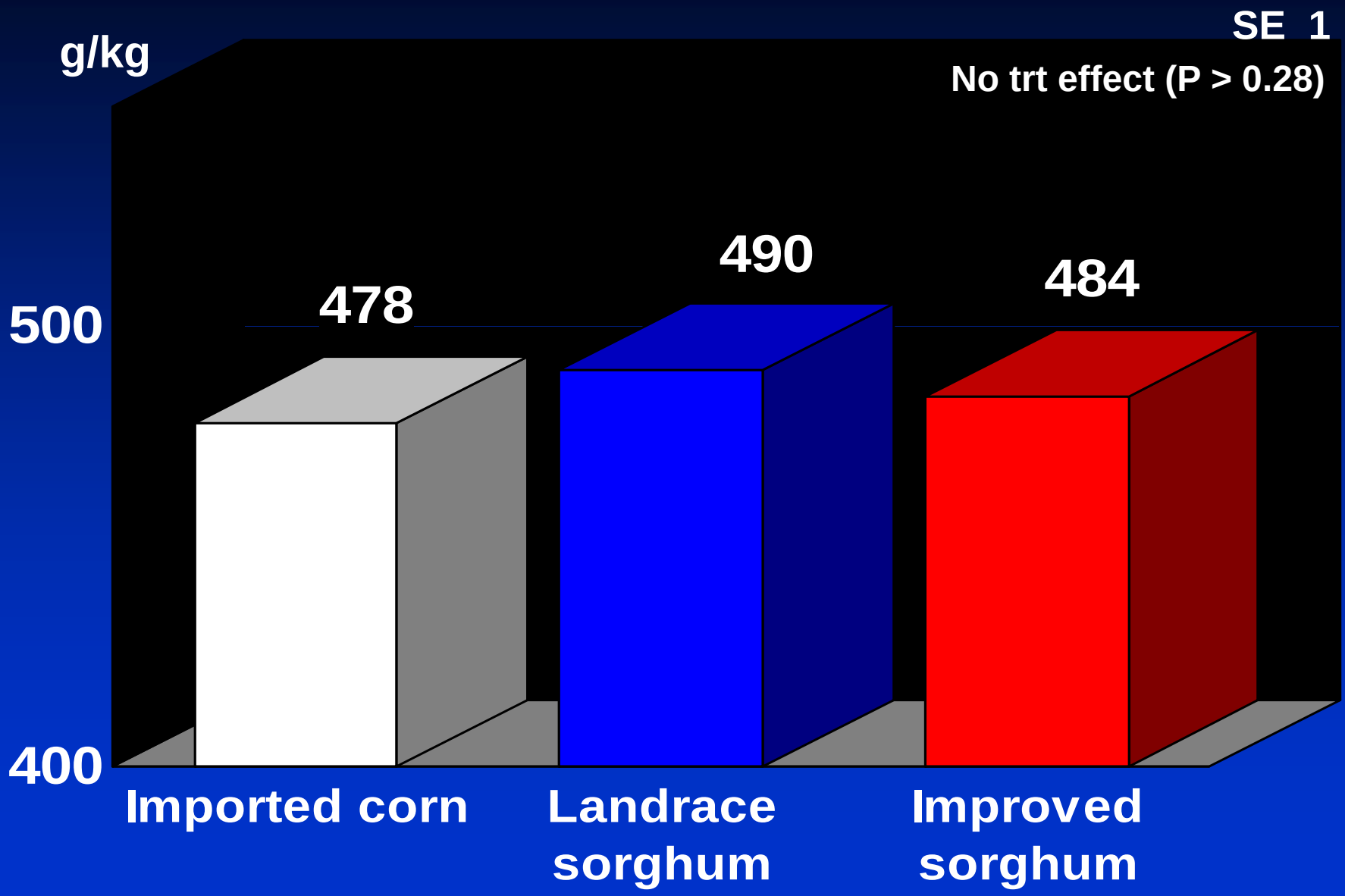
**To determine the feeding value of diets made with imported corn, a local landrace sorghum, and an agronomically improved sorghum variety**

- **Trts:**
  - Imported corn
  - A locally produced landrace sorghum (Mota Galmi) with red seed, purple plant, and 0.3mg of CE/100mg grain DM
  - An improved variety (IRAT204) with white seed, tan plant, and no detectable tannins

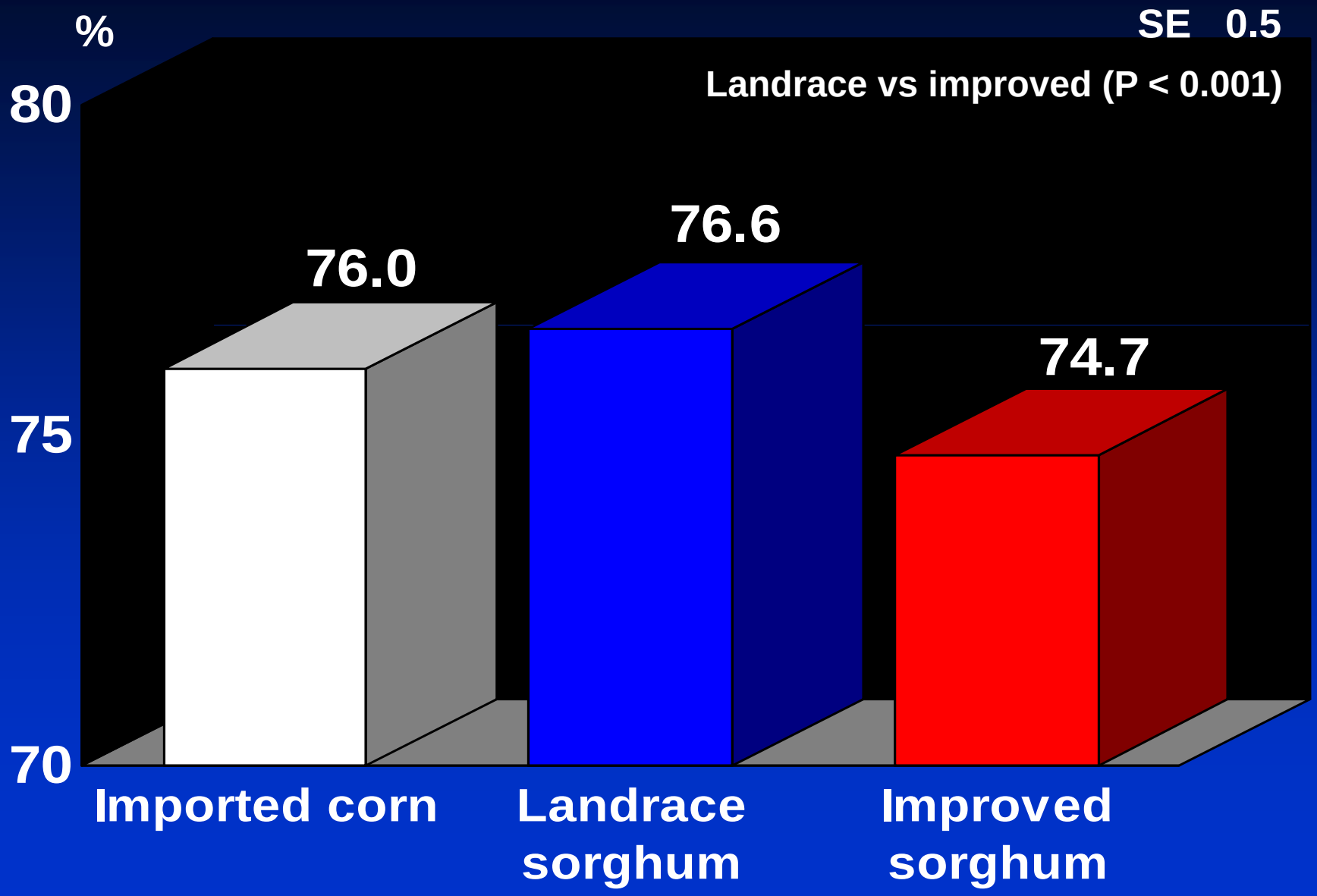
**Particle Size:** 600



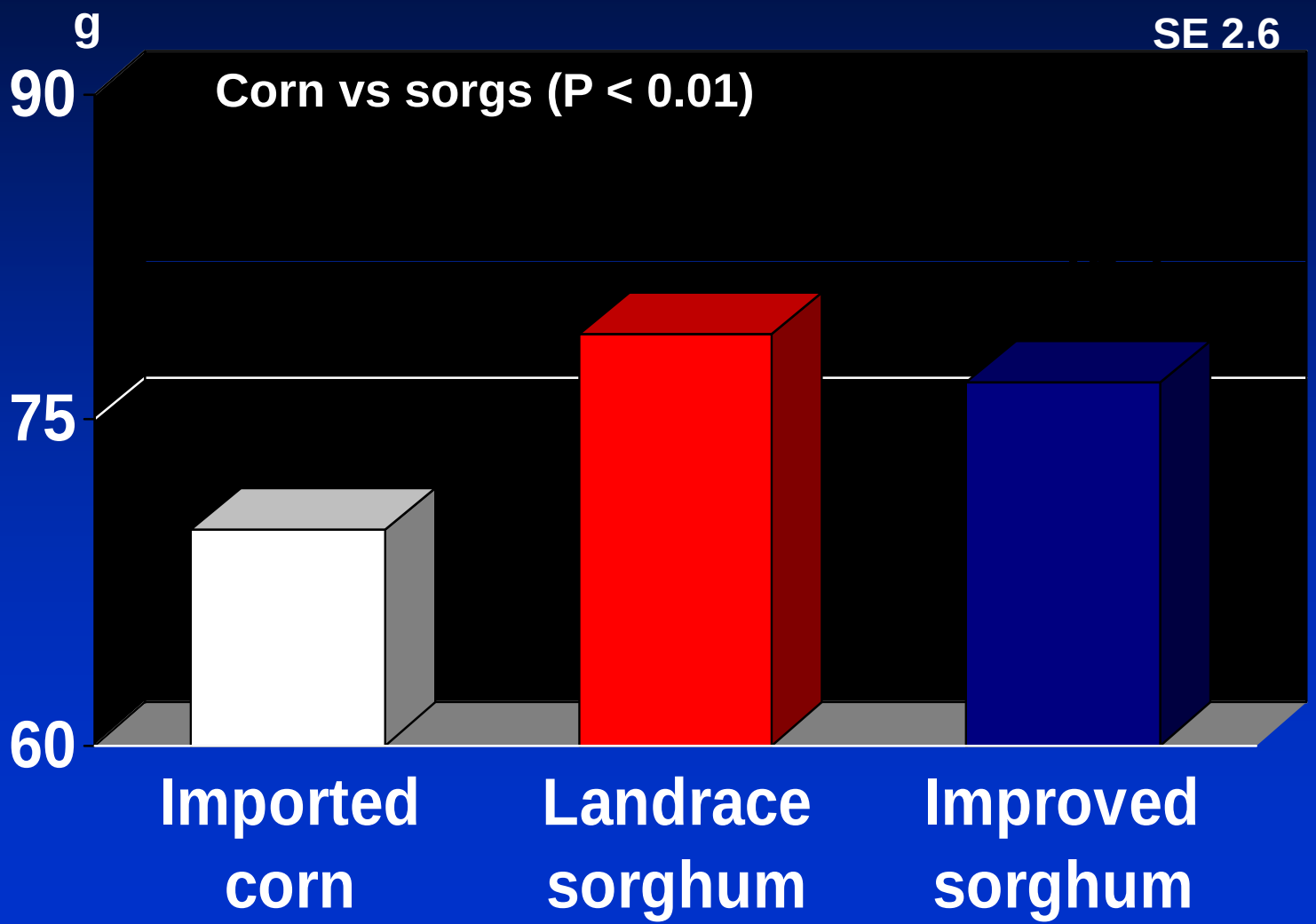
# Gain:Feed d 0 to 60



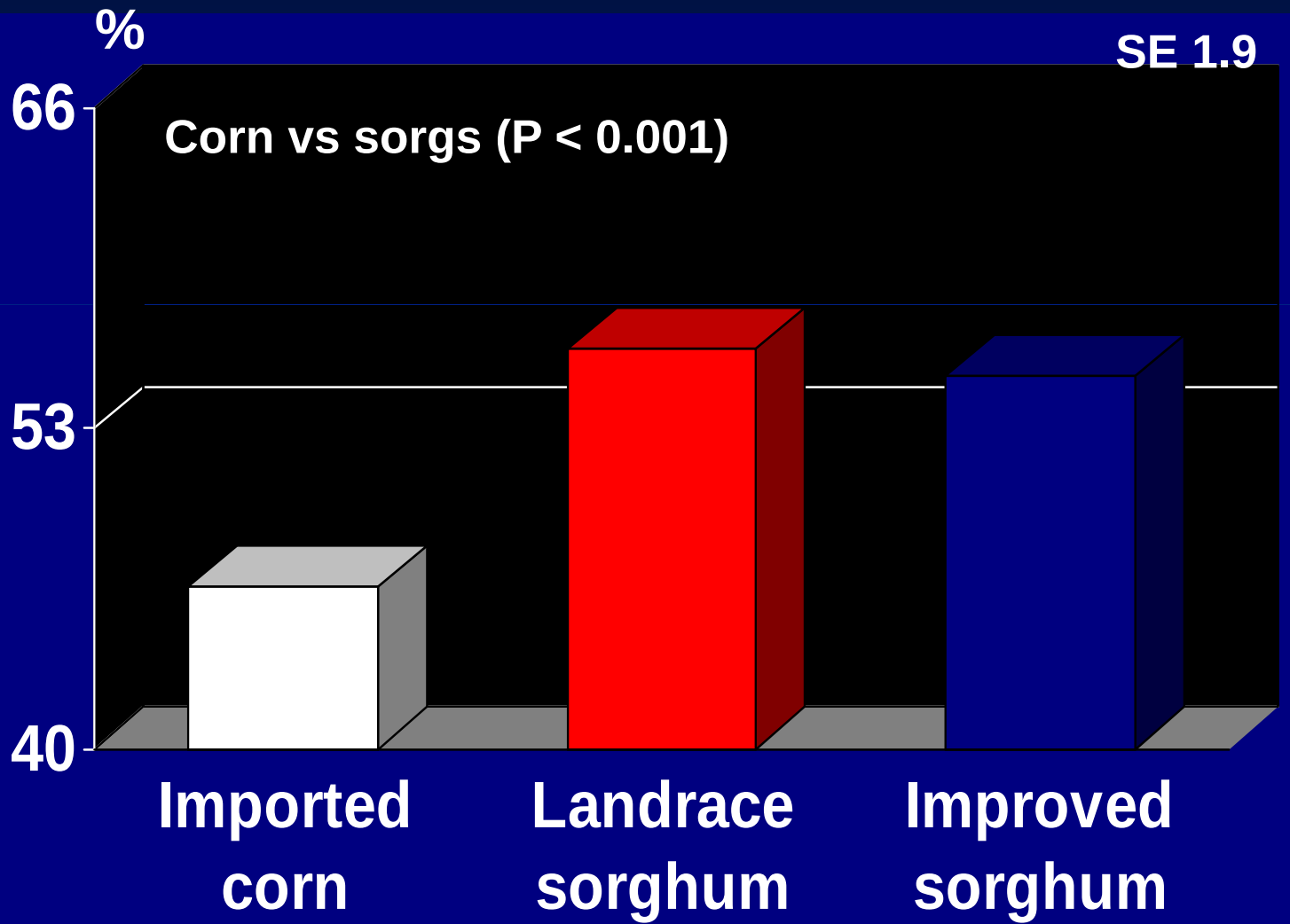
# Carcass Yield d 60



# Feed Intake for Layers Fed Corn vs Sorghums in West Africa



# Percentage Production for Layers Fed Corn vs Sorghums in West Africa



# Successes

- Completion of collaborative research projects with INRAN (2005 and 2006)
- Projects served as basis for an INRAN Sorghum Field Day and development of a Poultry Producers Association in Niamey (2005 and 2006)
- Experiments served as senior projects for two students at Abdou Momouni University, Niamey, Niger (2005 and 2006)
- Two papers at the 2006 International FRSIT Conference in Ouagadougou, Burkina Faso
- Two posters at the 2006 SICNA Conference, Santa Anna Puebla, NM

- Two posters at the 2007 National Field Day, Niamey, Niger
- Abstract at the 2007 Poultry Science Association Meetings, San Antonio, TX
- Presentation at the 2007 Technology Transfer Workshop, Senegal
- Abstract at the 2008 International Poultry Conference, Atlanta, GA
- Presentations in the USGC Sorghum Utilization Workshops in Ireland, England, Holland, and France, 2008
- Session Chair for the 2008 Int. Conf. for Competitiveness in Poultry for Africa, Senegal

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## Organisateur

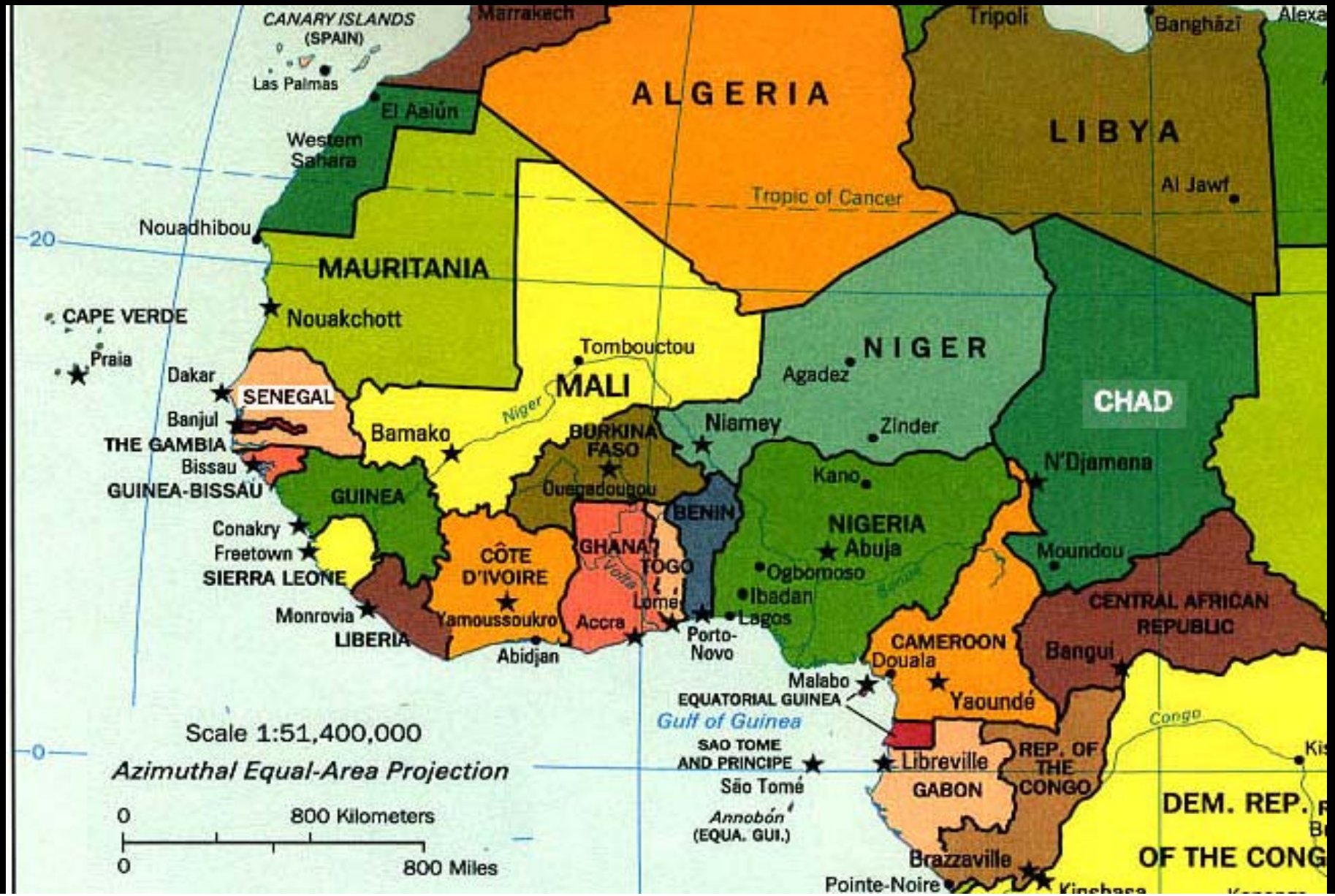
Département des Sciences Biologiques et des Productions Animales. Ecole Inter-Etats des Sciences et Médecine Vétérinaires de Dakar, Université Cheikh Anta Diop de Dakar, Sénégal

# So, what's next?

# Feeding Value of Corn vs Properly Milled Local Sorghum for Poultry in West Africa


- Salissou Issa and Joe Hancock Kansas State University, Manhattan, USA
- Ayao Missohou, Regional College of Sciences and Veterinary Medicine (EISMV), Dakar, Senegal
- Bantieni Traore, Institute of Rural Economy (IER), Bamako, Mali
- Hien Ollo, National Institute for Environment and Agricultural Research (INERA), Bobo-Diolasso, Burkina Faso
- Hamani Marichatou, Abdou Moumouni University (UAM), Niamey, Niger
- Iro Nkama, University of Maiduguri, Nigeria

# West Africa


CANARY ISLANDS
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Las Palmas
Marrakech
Tripoli
Banghāzī
ALGERIA
LIBYA
El Aaiún
Western Sahara
Tropic of Cancer
Al Jawf
Nouadhibou
MAURITANIA
Nouakchott
CAPE VERDE
Praia
Tombouctou
NIGER
Agadez
Dakar
SENEGAL
MALI
CHAD
Banjul
THE GAMBIA
Bissau
GUINEA-BISSAU
Bamako
Niger
BURKINA FASO
Ouagadougou
Niamey
Zinder
N'Djamena
Kano
GUINEA
Conakry
Freetown
SIERRA LEONE
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CAMEROON
Douala
Yaoundé
Malabo
EQUATORIAL GUINEA
Gulf of Guinea
Congo
SAO TOME AND PRINCIPE
São Tomé
Annobón (EQUA. GUI.)
Libreville
GABON
REP. OF THE CONGO
DEM. REP.
Brazzaville
Pointe-Noire
Kinshasa
Scale 1:51,400,000
Azimuthal Equal-Area Projection
0
800 Kilometers
0
800 Miles
20
0

- **TRTS: Corn and locally produced sorghum (non-tannin) ground through 6.4 and 2 mm screens**
- **Samples of all cereals and diets collected and subjected to p-size and proximate determinations**
- **Each station to feed a minimum of 400 1-d-old broiler chicks (25 birds/pen and four pens/trt) for 42 d**

- Feed and water consumed ad libitum
- Birds killed (12) and carcass yield recorded
- Response criteria will be ADG, ADFI, G:F, and carcass yield
- All data pooled and analyzed as a 2 x 2 factorial with main effects of cereal source and particle size

# Difficulties

- Funding (Provide enough as things are more expensive than in USA or EC)
- Facilities (poultry houses, feed mill
- Input Accessibility (feed ingredients, chicks)
- Transportation

# Success

- Create a West African/KSU poultry Network
- Premix for the 5 project sites
- Discuss protocol and data collection forms
- Improving the poultry house (lighting, compartments)
- Strength relationships between Research Institutes, Universities, and Processors (Poultry producers and feeds industries)
- Training (8 students) and information exchange (22 presentation related to sorghum processing and utilization)

# Questions?