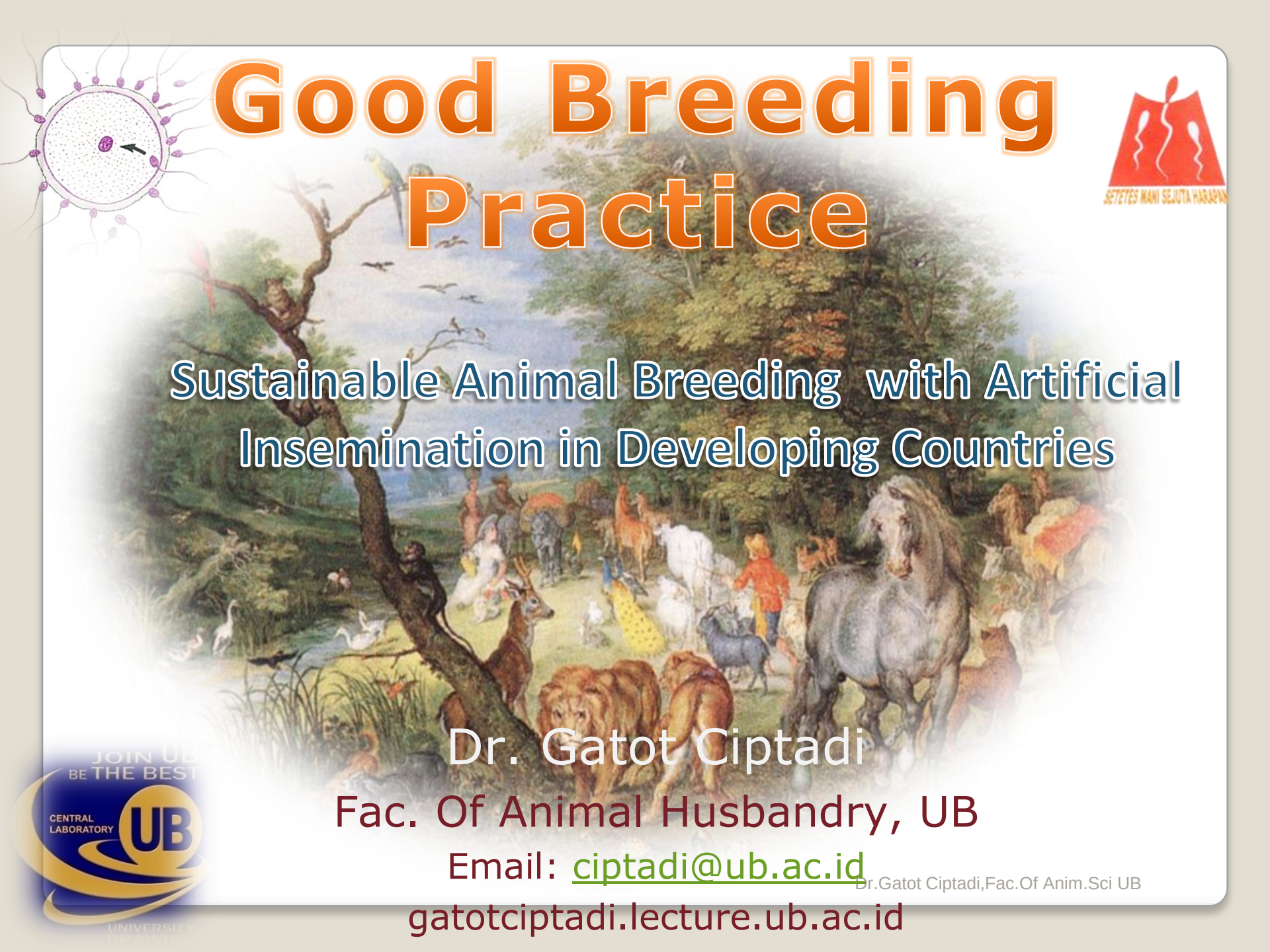
Good Breeding Practice



Sustainable Animal Breeding with Artificial Insemination in Developing Countries

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Animal Breeding Practices
Genetic Impact

Breeding has an important impact on animal production, as breeding results are cumulative, permanent and disseminated across farm animal populations and also different area or countries

The Sustainability

is set to balance the various objective connected with :

economic, the environment, diseases,

the preservation of our Genetic Resources

and maintenance of animal welfare

International relationship and Networking

- Maintenance of indigenous breeds is not only one country's work. Transboundary collaboration is necessary.
- There are some breeds which can't be maintained by any country alone, their preservation needs effective international collaboration
- An international cooperation is very important in research and in practice.

Animal Breeding in the Near Future:
Modern Breeding

Participatory and Modern Breeding

Feature	Participatory	Modern
Drivers of program	Demand (users)	Supply (breeders)
Structure	Usually open to upward gene-flow	Usually closed to upward gene-flow
Genotype	Local breeds	Int. breeds
Breeding objective	Set by participants	Set by breeders
Traits	Adaptation, etc.	Production, etc.
Selection criteria	Visual, performance	Pedigree, performance

Source: Modified from J. Mueller (unpublished)

Lesson and Problems in Genetic Improvement

Breeding programs have been too complicated to be practical ?

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Breed selection (pure) and cross-breeding programs ?

No analysis data done(availability, accuracy etc) .

No comprehensive approach to design simple, yet effective breeding strategies.

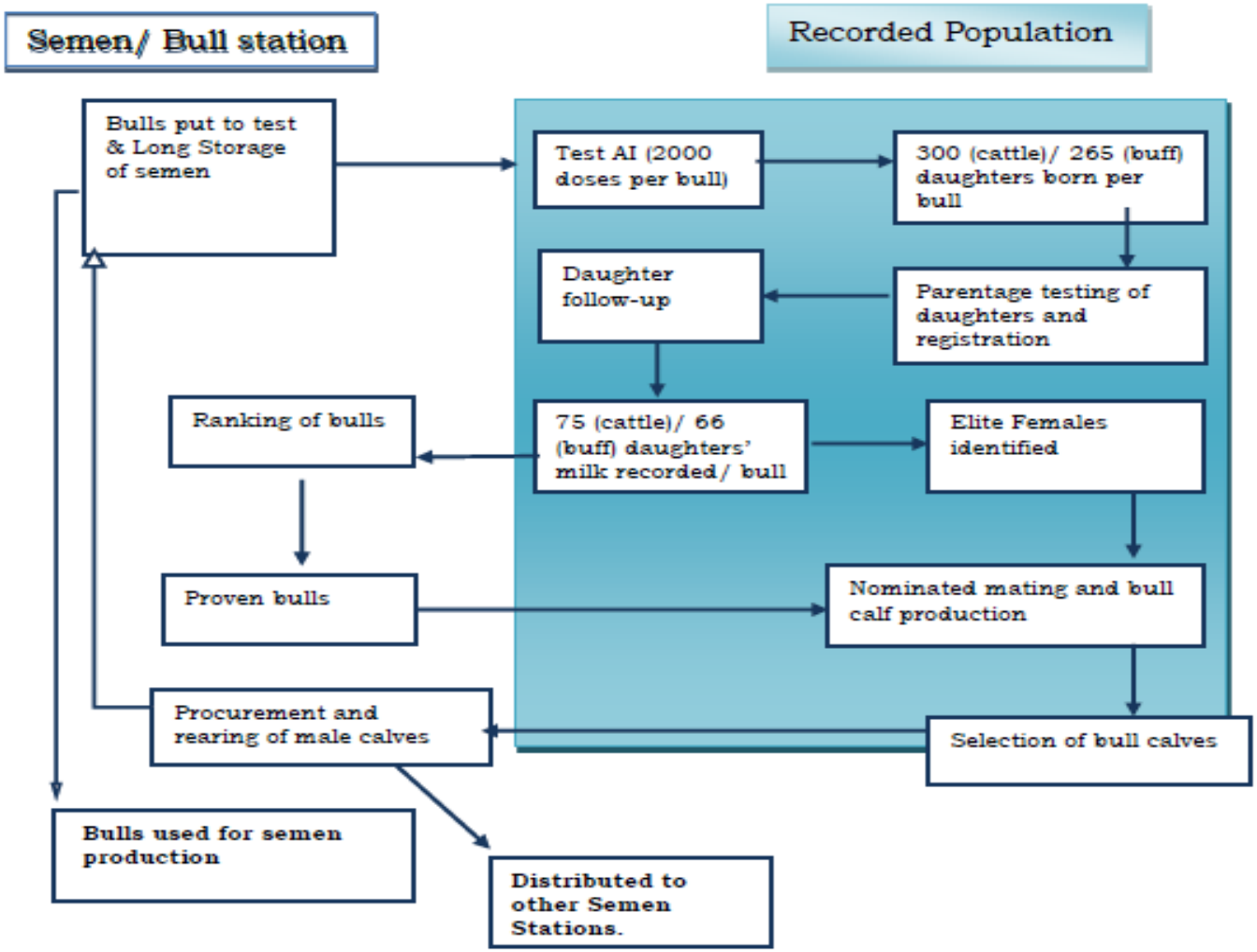
For planning genetic improvement, an intelligent balance of genetic principles and consideration of practical aspects is needed

Ideal Progeny Test Program : Standart Operation Procedure (SOP) in Developing countries?

- High pedigree merit
- Large number of bulls
- Rapid and accurate evaluation
- Large number of daughters/herds
- **Intensive culling**

- **Objectives ?: Document characteristics of national progeny test (PT) programs**
  - **Age of bulls at decision**
  - **Percent of bulls retained**
  - **Standardized selection differentials (selection intensities)**
- **Compare PT strategies of different countries**

Progeny testing –Bulls evaluated on the basis of daughters performance, (Important to Lay off System of Bull).



Practical Animal breeding:

represents an effort to induce specific traits beneficial Anim. Breeding culling out undesirable characteristics and selected the desirable genes into future generations

Livestock farmers have been practicing selective breeding over many centuries (Phenotypic base).
A number majority of breeds have been created by livestock breeders

Uncontrolled breeding remains to be a major feature of indigenous breeding/local breed.

Animals Breeding Systems

- **Two basic systems**
  - **Straight breeding:**
    - Purebred breeding
    - Inbreeding
    - Outcrossing
    - Grading up
  - **Crossbreeding:**
    - Two-breed crosses
    - Three-breed crosses
    - Rotation breeding

System used depends on:

Kind of livestock

Size of the herd

Amount of money available

Goals of the farmer or breeder

What is The best way of Animal Breeding Program:

Allows farmer/ GROUP OF FARMER/ ABREEDER ASSOCIATION to fully participate in the:

- Identification of problems
- Choice of solutions
- Breeding objectives
- Implementation of a simple breeding program
- Possible to control superior genotypes

Government/Researcher/University/RD

- Research driven by needs and wishes of end users.
- Involves in the design, implementation and evaluation of breeding strategies

Principles for preparation of Anim.breeding (Genetic Local Resc. and Conservation)

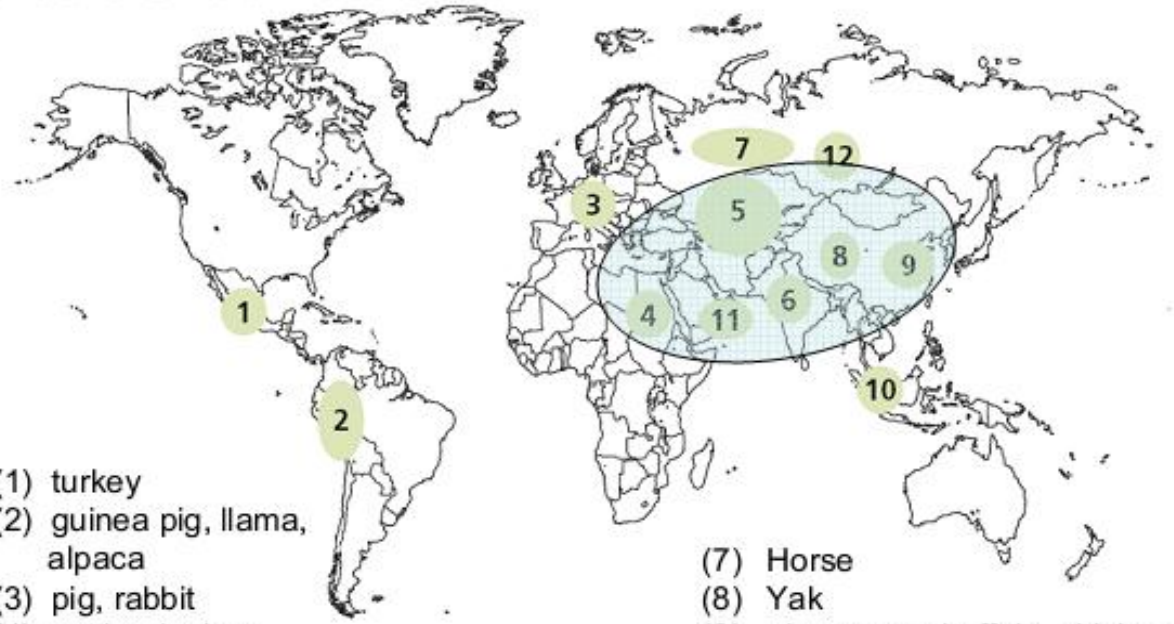
Breeding program must be such a regulation which can assure the maintenance of a breed with avoidance of close inbreeding and preservation of original features.

- In situ: maintenance among the original keeping and feeding conditions, production and selection methods
- Ex situ: if in situ conservation is not possible. It means preservation out of the original and traditional circumstances (also contains in vitro conservation).

Genetic Resc. Potential and Conservation

Most of the world's diversity is in the developing world

Centers of domestication



(1) turkey
(2) guinea pig, llama, alpaca
(3) pig, rabbit
(4) cattle, donkey
(5) cattle, pig, goat, sheep, Bactrian camel
(6) cattle, goat, chicken, river buffalo
(7) Horse
(8) Yak
(9) pig, swamp buffalo, chicken
(10) chicken, pig, Bali cattle
(11) Dromedary
(12) reindeer

Source: FAO, 2007

Breeding goal

- Preservation of external and internal characteristics of traditional breeds.
- Maintenance of the original type
- Preservation of breeds' adaptability to natural farming conditions.
- Achievement of good productivity (growth, reproduction).
- Preservation of breeds' natural temperament and behaviour which are necessary for traditional keeping methods.

Content of Breeding program (1)

- Detailed description of the breed
- Identification and certification method of a breeding animal
- Principles of nucleus herds' definition (minimal number of animals needed for maintenance of the breed; 1000 dams fit for breeding + needed sires)
- Semen and genetic samples should be kept in gene bank
- Order of classification method in herd-book
- Method of breeding animals' qualification, foundation of genealogical lines (families), principles for mating plan
- Rules of sires' selection

Content of Breeding program (2)

- Method of finding out breeds' genetic resources and admission of founder animals into conservation program.
- Method and order of data admission into central database.
- Rules of breeding animal commerce, export-import.
- Described principles of in situ conservation; accepted conditions of ex situ conservation.
- Certification method of slaughtering animals which are true to variety.

General Conclusion

- Planning of genetic improvement : balance of genetic principles and consideration of practical aspects
- Farmer /Group/Community involvement is crucial for success. It is essential to have farmers motivated, organized and trained.
- Farmers should finding ways to combine production and adaptation to their breeding stock.
- Open to opportunities to develop approaches for sustainable improvement.
- Solutions to practical problems may be found in farmers local knowledge
- Most breeding projects require initial technical help, then should be planned to become self-driven.
- The challenge for field geneticists is to organize programs fitted to each situation and sustainable in time.
- High impact a functional genetic structure is necessary.
- **Role of Researchers**: conducting a study , oriented in problem solving (action research).