2nd SoW-AnGR - Report of national priorities and reporting process – the Netherlands

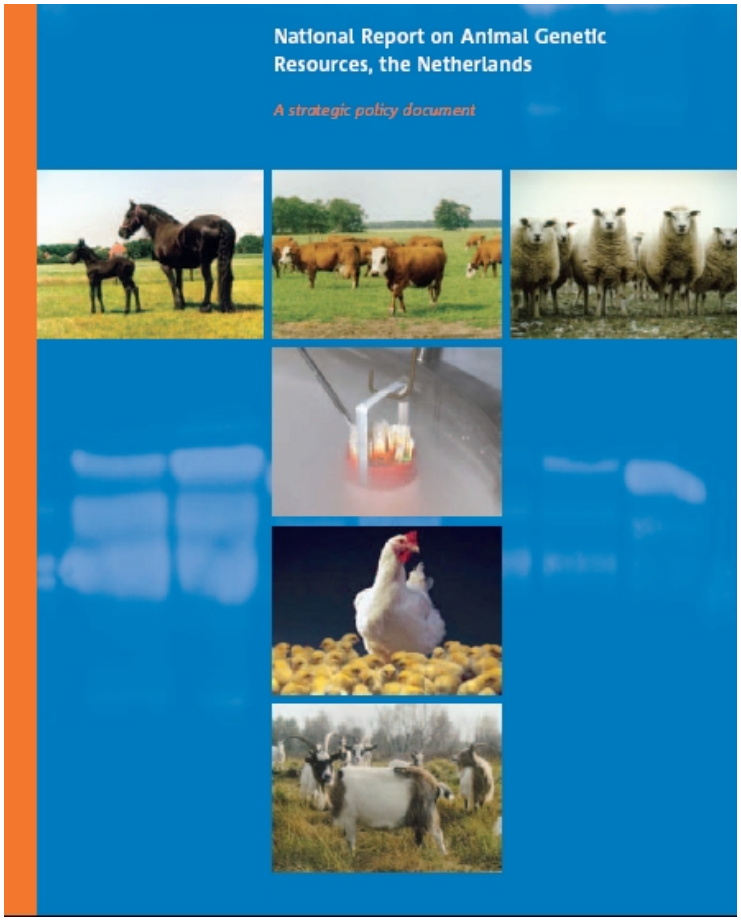
Side event – ITWG-AnGR – 28 November 2014

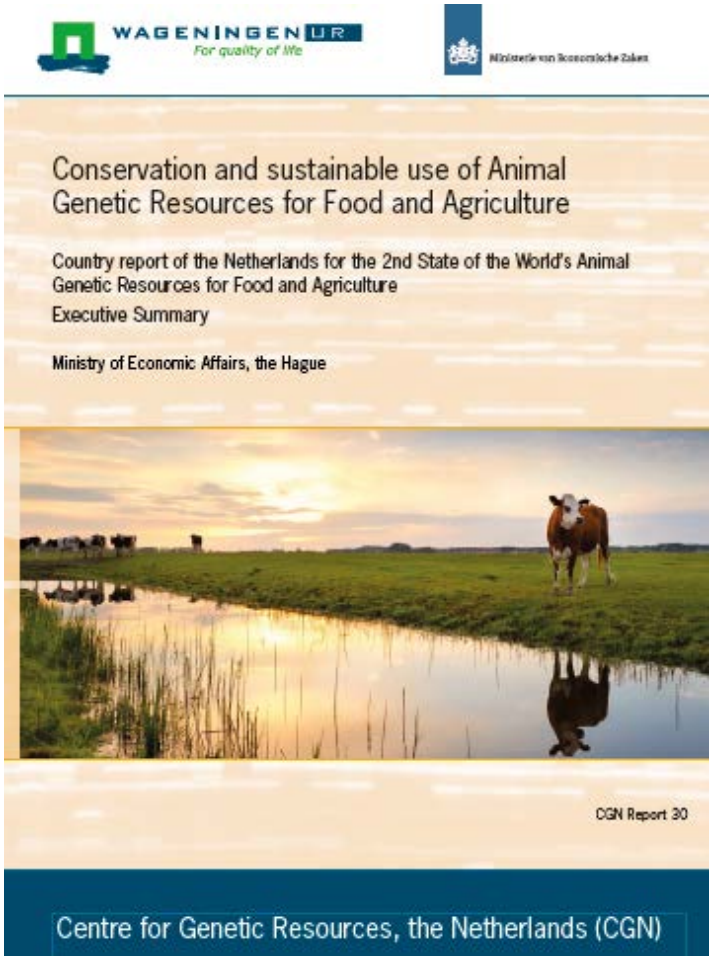
Sipke Joost Hiemstra, National Coordinator – the Netherlands

The livestock sector in the Netherlands

- Efficient, specialized animal production sectors
- Global supplier of improved breeding stock
- One of the largest exporters of animal products

National strategy for AnGR management?





Process

- Stakeholder advisory group
  - Government, Breeding Industry, Rare Breeds Foundation, Wageningen University, Centre for Genetic Resources, the Netherlands (CGN)
- Coordination by National Coordinator
- Collection of data and filling Country report questionnaire
- Discussion in advisory group
  - Key trends and driving forces, SWOT analysis, State of GPA implementation, Strategic priorities
- Executive Summary

AnGR – NL: what has changed in past 10 years?

- No big changes in risk status of breeds
- More awareness, but continuing threats

Species	Locally adapted/native breeds [7] (number)	Locally adapted/native breeds which have status 'critical', 'endangered' or 'vulnerable' (number)	All breeds (number)
Cattle	10	7	40
Sheep	12	9	70
Goats	5	4	14
Pigs	14	1	21
Chicken	70	39	225
Horse	7	5	40

Key trends and driving forces affecting AnGR management

- Global food security challenge
- Specialization and scale enlargement
- Sustainable breeding programs and breeding for sustainability
- Technology revolution
- Standardization vs diversification

Dutch – Strategic Priorities for AnGR (2014)

1. Implementation of ‘national plan in situ’
2. Conserve what we still have, in ex situ in vitro collections
3. Application of genomic and reproductive technologies
4. Better characterization of between and within breed genetic diversity
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6. International capacity building and knowledge exchange

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Conservation - Key players

- Breeding industry/breed societies
- Centre for Genetic Resources The Netherlands (CGN)
- Foundation of Dutch Rare Breeds (SZH)
- Science and education
- Landscape and nature protection organisations
- Etc,

→Many actors!

→Long term responsibility of government

National plan *in situ*

- 3 National NGO's joining forces
  - Dutch Rare Breeds Society (SZH)
  - Network traditional crop varieties (Eeuwig Moes)
  - Network of forest/landscape/nature land owners (VBLE)
- Support by Centre for Genetic Resources, the Netherlands
- Objectives of national plan *in situ*
  - Raising awareness to conserve traditional Dutch breeds and varieties
  - Development of market-oriented strategies
  - Promoting products and (ecosystem) services
  - Better characterization of traditional breeds/varieties
  - Knowledge transfer

Centre for Genetic Resources, the Netherlands

- Ex situ conservation
  - Gene bank collections
- Support for *in situ* management
  - small populations of Dutch origin
  - minimising inbreeding rates
  - breeding programs
  - use of gene bank germplasm
- Policy advice
- National Focal Point
- Supportive research
  - Cryobiology and conservation genetics/genomics

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Size of CGN gene bank collections today

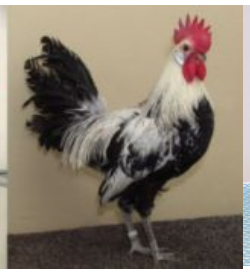
Species	# breeds	# donors / breed	# straws
Cattle	19	1 - 4,781	221,925
Chicken	31	1 - 20	18,828
Dog	5	1 – 8	342
Duck	3	14 – 34	1,588
Goat	4	1 - 33	5,555
Goose	1	7	76
Horse	8	1 - 37	25,769
Pig	21	1 - 69	75,081
Sheep	9	8 - 71	27,738

Dutch livestock species and breeds


















Gene bank moved to new facility at Wageningen University Campus

Plans for the next years 2015-2019

- Establishment of core collections for all Native Dutch Breeds
- Develop/implement new technologies for cryopreservation and reproduction
  - Female genotypes – in addition to semen
  - Embryo's (cattle, horse)
  - Ovarian tissue

BIOLOGY OF REPRODUCTION 83, 15–19 (2010)
Published online before print 17 March 2010.
DOI 10.1095/biolreprod.110.083733

Production of Donor-Derived Offspring from Cryopreserved Ovarian Tissue in Japanese Quail (*Coturnix japonica*)[1]

Jianan Liu,[3,4] Yonghong Song,[3,4] Kimberly M. Cheng,[3] and Frederick G. Silversides[4]

Faculty of Land and Food Systems,[3] University of British Columbia, Vancouver, British Columbia, Canada
Agassiz Research Centre,[4] Agriculture and Agri-Food Canada, Agassiz, British Columbia, Canada

- Genomics and conservation: use of sequence information

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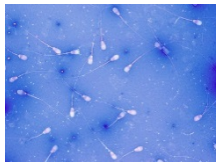
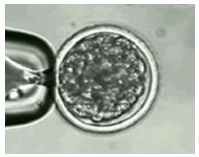
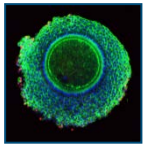
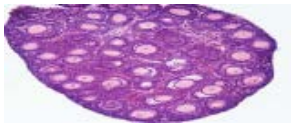

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Opportunities <-> technology

Genetic markers for breeding and conservation of farm animal genetic diversity

Past 30 years	Last decade	Nowadays
Pedigree	SNP chip	Whole Genome Sequence (WGS)
No markers Genealogic records	Subset of markers	All markers

Improvement technology

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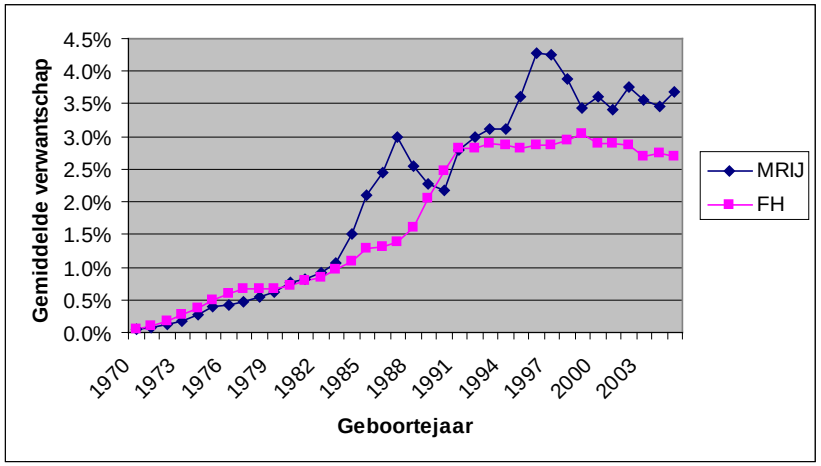
Sustainable breeding programs and breeding for sustainability

- Sustainable breeding goals became important national policy issue
- Broader breeding goals
- Minimize inbreeding rates
- Zootechnical (EU) legislation
- Breed4Food Public-Private-Partnership Research and Development
- Codes of good practice



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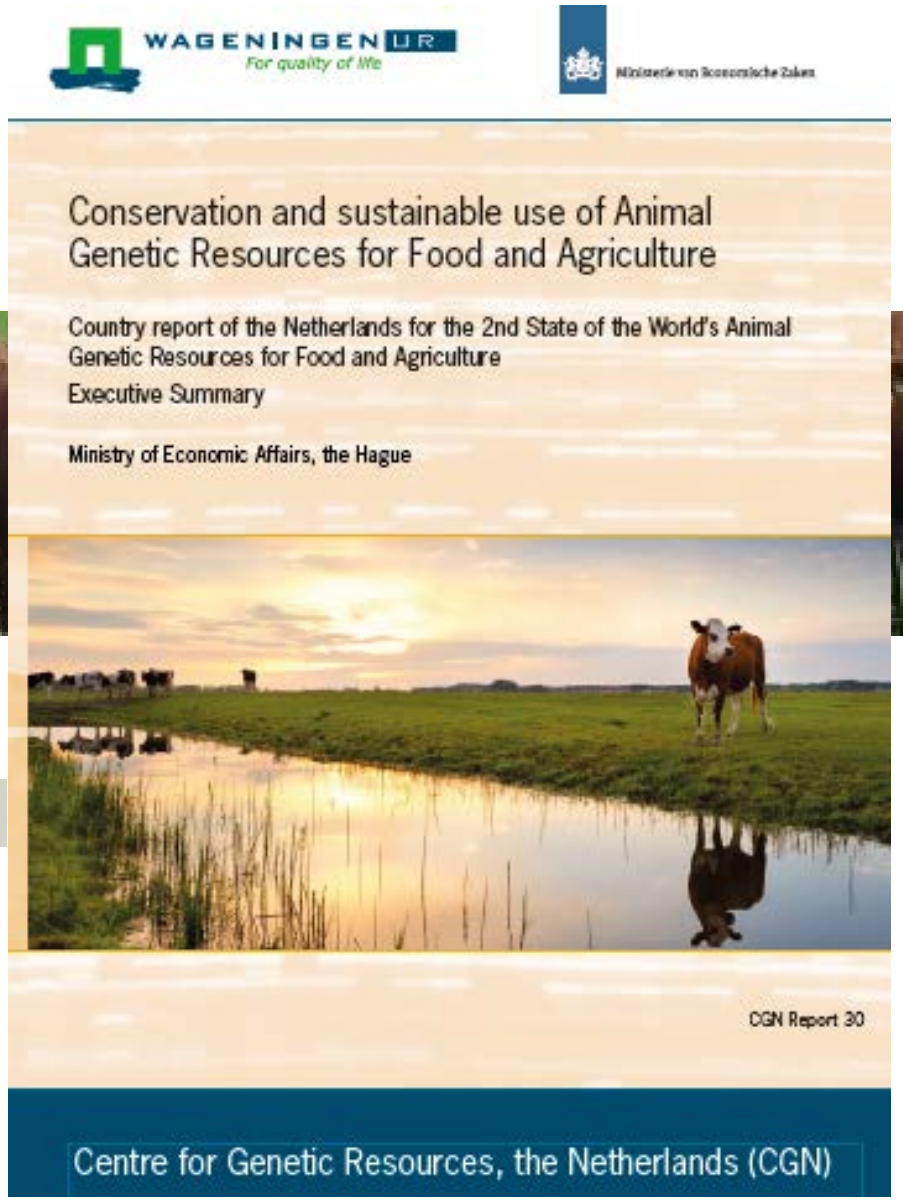
Wageningen University – Animal Breeding and Genomics Centre

- BSc and MSc course
  - E.g. European Master (EMABG)
- PhD training
  - Graduate school WIAS
    (45 PhD candidates - 50% international)
  - European Graduate School on Animal Breeding and Genetics (EGS-ABG)
    (Joint PhD program of 4 EU universities)
  - Sandwich PhD models
- Project based training and capacity building
  - E.g. for National Dairy Development Board – India
  - E.g. Capacity building in East Africa

Thank you for your attention

www.cgn.wur.nl



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