

4th IMAGE DIALOGUE FORUM



European Project n° 677353



Access and Benefit sharing in animal breeding, conservation and research



Elżbieta Martyniuk
WARSAW UNIVERSITY OF LIFE SCIENCES





Content

- New ABS legal landscape
- Specific characteristics of AnGR
- Gene flow of AnGR
- Impact of ABS measures
 - animal breeding
 - conservation of AnGR & genebanking
 - research
- Image project
- Conclusions

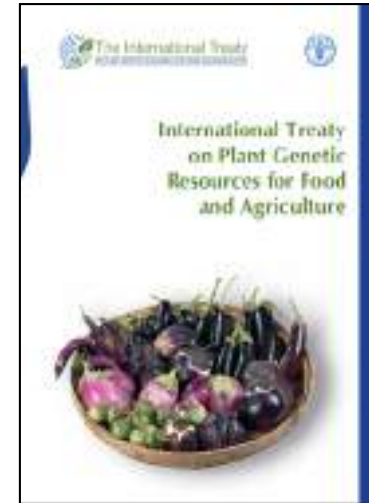




New ABS legal landscape

Since the **Convention on biological diversity, 1992/1993**

- **First ABS specialised instrument:**
International Treaty on Plant Genetic Resources for Food and Agriculture, **2001/2004**
- **Nagoya Protocol on ABS, 2010/2014**
- **EU ABS Regulation, 2014/2015**





Summary: ABC of the Nagoya Protocol

- **Access**

- to GR and TK (**PIC**)
- (or no access regulations)

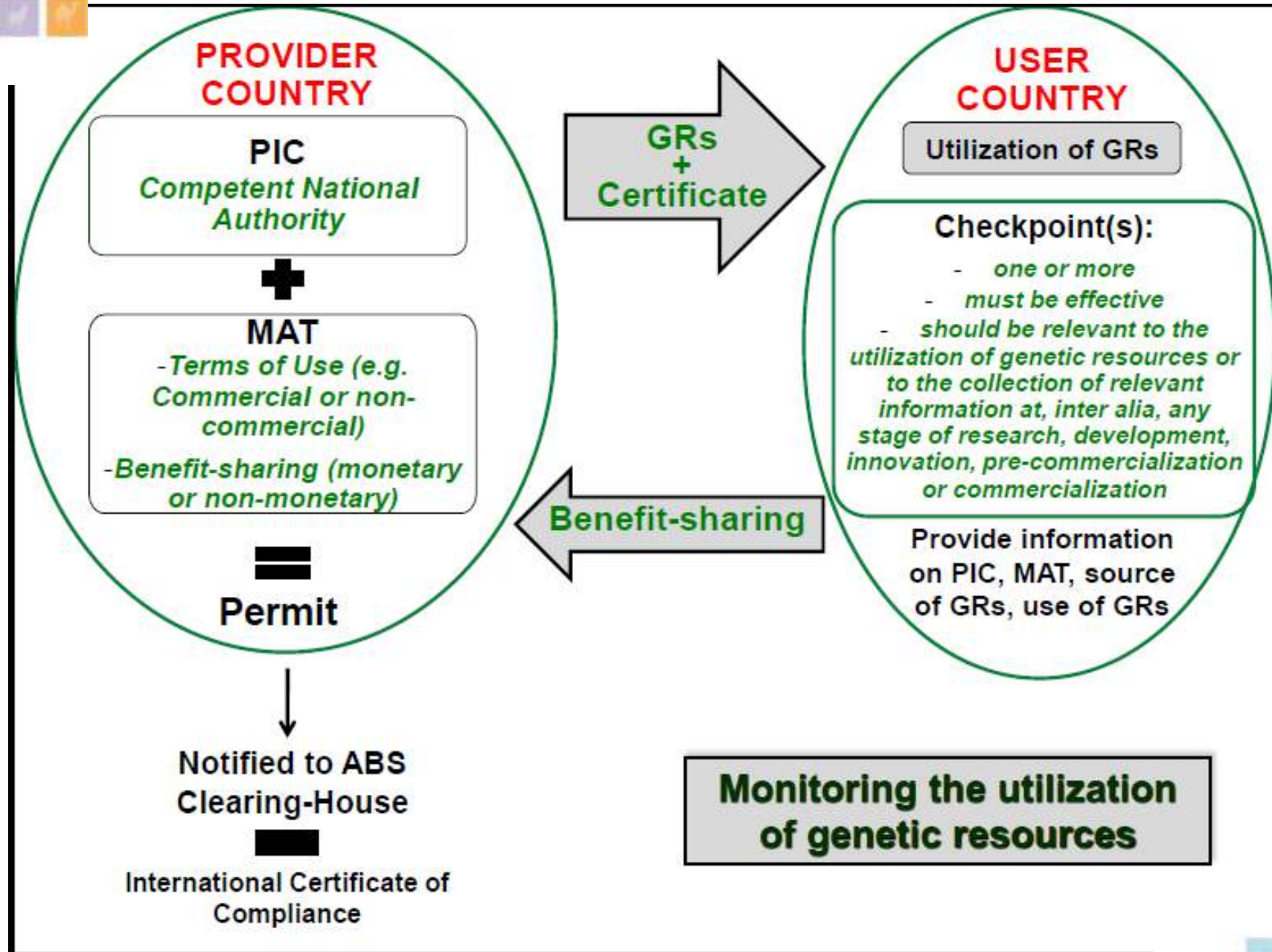
- **Benefit Sharing**

- **bilaterally: according to MAT**
- the GMBSM?
- monetary/non-monetary

- **Compliance**

- national legislation
- IRCC / checkpoints
- checks on users





(Valerie Normand, 2012)





Nagoya Protocol: ABC

- Adopted 12 October 2010
- Came into force 12 October 2014

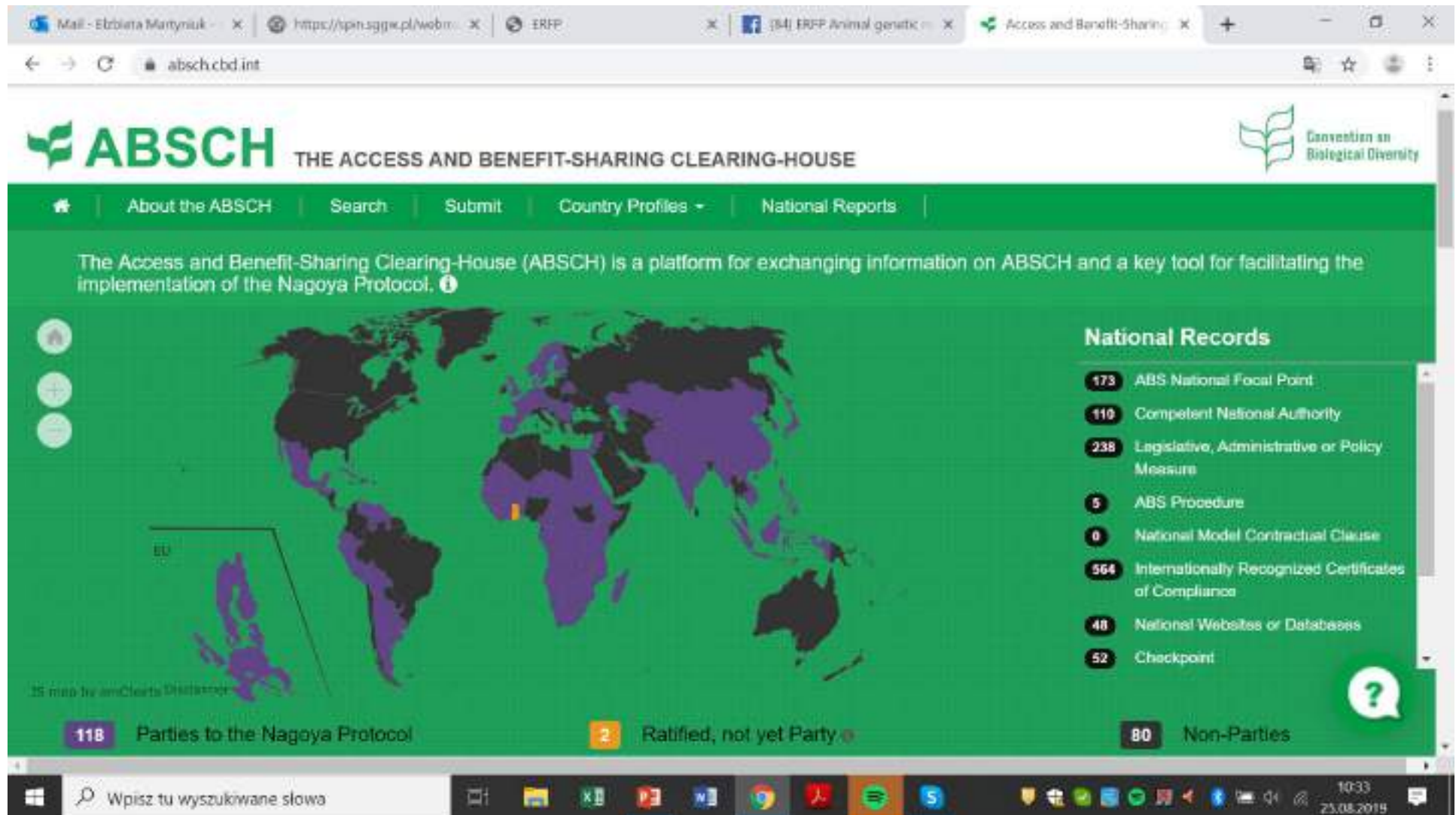
- As for 24th August 2019
 - Parties: **118 + 2**

 - National legislation: **238** acts by **64 countries**
 - IRCC: **564** certificates issued by **16 countries**
 - Checkpoints: **52** by **25 countries**

<https://absch.cbd.int/>



ABS Clearing House



The screenshot displays the ABSCH website interface. At the top, there is a navigation bar with the ABSCH logo and the text "THE ACCESS AND BENEFIT-SHARING CLEARING-HOUSE". Below this, a green banner contains the text: "The Access and Benefit-Sharing Clearing-House (ABSCH) is a platform for exchanging information on ABSCH and a key tool for facilitating the implementation of the Nagoya Protocol." A world map is shown with countries colored in purple and orange. To the right of the map is a "National Records" section with a list of statistics. At the bottom of the map area, there are three summary boxes: "118 Parties to the Nagoya Protocol", "2 Ratified, not yet Party", and "80 Non-Parties". The browser's address bar shows "absch.cbd.int". The Windows taskbar at the bottom includes a search bar with the text "Wpisz tu wyszukiwane słowa" and the date "25.08.2019".

ABSCH THE ACCESS AND BENEFIT-SHARING CLEARING-HOUSE

Convention on Biological Diversity

About the ABSCH | Search | Submit | Country Profiles | National Reports

The Access and Benefit-Sharing Clearing-House (ABSCH) is a platform for exchanging information on ABSCH and a key tool for facilitating the implementation of the Nagoya Protocol.

National Records

- 173 ABS National Focal Point
- 110 Competent National Authority
- 238 Legislative, Administrative or Policy Measure
- 5 ABS Procedure
- 0 National Model Contractual Clause
- 564 Internationally Recognized Certificates of Compliance
- 48 National Websites or Databases
- 52 Checkpoint

118 Parties to the Nagoya Protocol | 2 Ratified, not yet Party | 80 Non-Parties



Specific characteristics of AnGR

Diverse breeding systems:

- pastoralists – sometimes collective ownership with customary law
- small-scale subsistence farmers and smallholders - individual ownership of livestock
- centralized breeding systems with breeding organizations - private companies or cooperatives

Open market:

- domestic and international exchange by private-private transaction
- contracts from very simple to very sophisticated
- price according to the phenotypic/genetic value

Information standards on transfer germplasm set by:

- WTO: Sanitary and Phytosanitary measures (SPS)
- EU zootechnical legislation (pedigree, genetic value)

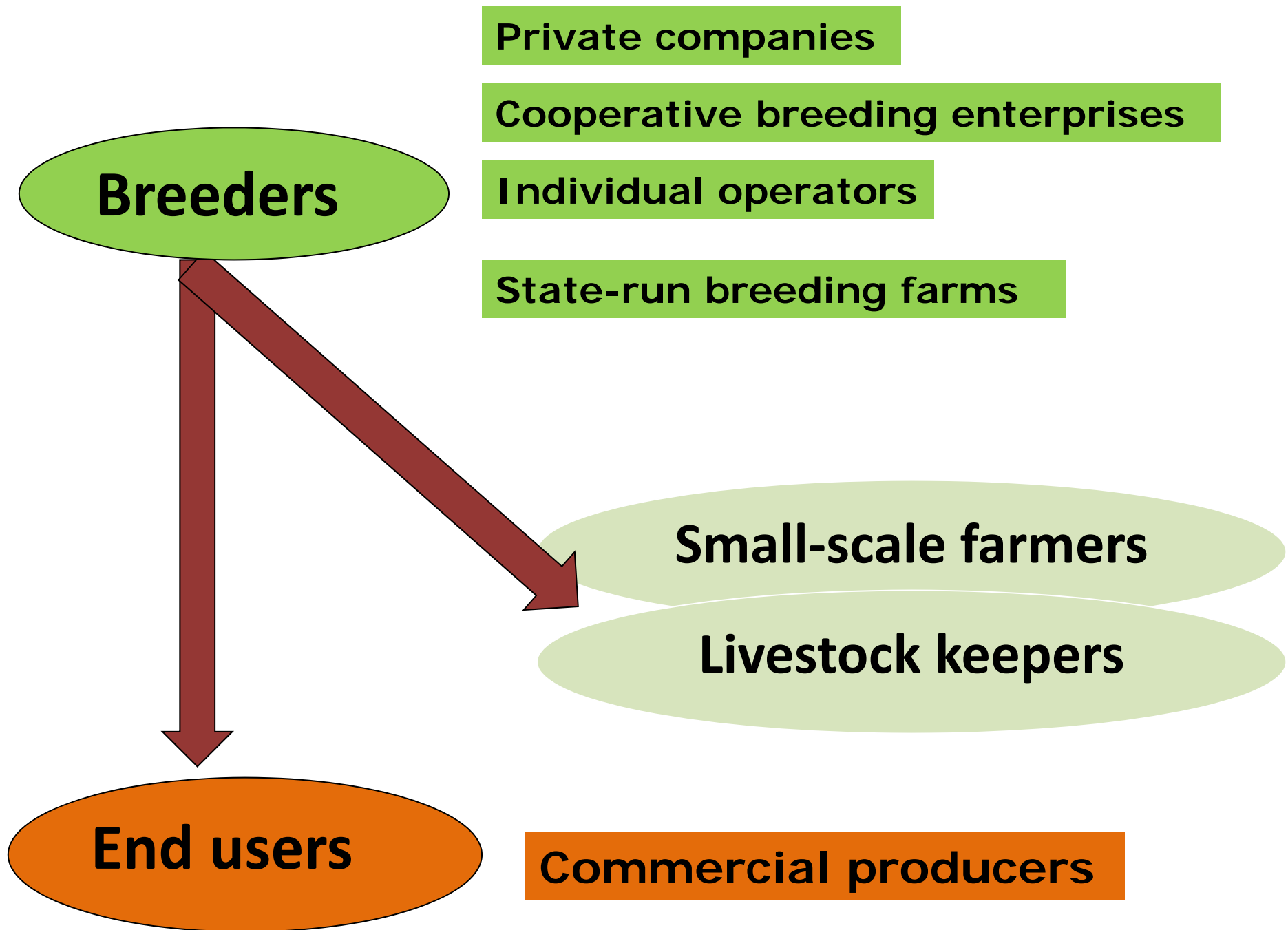




Specific characteristics of AnGR

- A wide range of stakeholders, including:
 - ✓ individual livestock keepers and breeders,
 - ✓ pastoralists and their associations,
 - ✓ breeding and herd book associations,
 - ✓ the breeding industry,
 - ✓ breeding and research centres,
 - ✓ conservation farms and facilities,
 - ✓ genebanks,
 - ✓ universities & researchers,
 - ✓ extension and veterinary services,
 - ✓ non-governmental organizations (NGOs),
 - ✓ relevant regulatory national authorities.





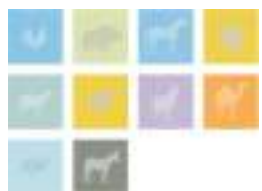
(FAO, 2009)



Specific characteristics of AnGR

- Private ownership
- Small part of AnGR in public domain
 - breeding/research stations
 - genebanks





Agro-biodiversity: sectoral differences

	PGR	AnGR
Ownership	public genebanks	private
Value of individual	low	high to very high
Exchange	S→N	N→N and N→S
Trading	farmers'/breeders' rights	bilateral agreements
Inbreeding	used extensively	not desirable
Breeding/testing costs	inexpensive	expensive
GM	possible/efficient	difficult/not accepted
Patentability (TRIPS)	varieties	breeds not patentable
Centres of origin	well defined	multiple domestication

Adapted from Hiemstra et al. 2006





Gene flow of AnGR

- Major gene flow:
N → **N** and **N** → **S** supporting enhancement of livestock production in developing countries „the Livestock revolution”
- Very limited **S** → **N**
- Rare examples on successful introgression of exotic AnGR to mainstream breeds (e.g. Meishan pig: early maturity, high litter size but slow growth and high fat level)
- Use of wild species almost negligible





Gene flow of AnGR

- Growing **S** → **S** flow

Artur Mariante, 2013

Potentially will be most affected

by the Nagoya Protocol and national ABS legislation

3 years of negotiations between authorities of Brazil and India

RECENT EXCHANGE AGREEMENTS

- ❑ After the last ban that forbid the importation of zebu cattle from India in 1962, Brazil and India re-started the discussion about Animal Genetic Resource exchange in 1998.
- ❑ Recently, Brazil and India signed two Agreements:
 - ❖ Agreement to import embryos from India
 - ❖ Agreement to export semen from Brazil





Awassi sheep

Primitive fat tail sheep
from Arabian Peninsula





Israel, ARO Volcani Center

<http://www.freeisraelphotos.com/photo/69>

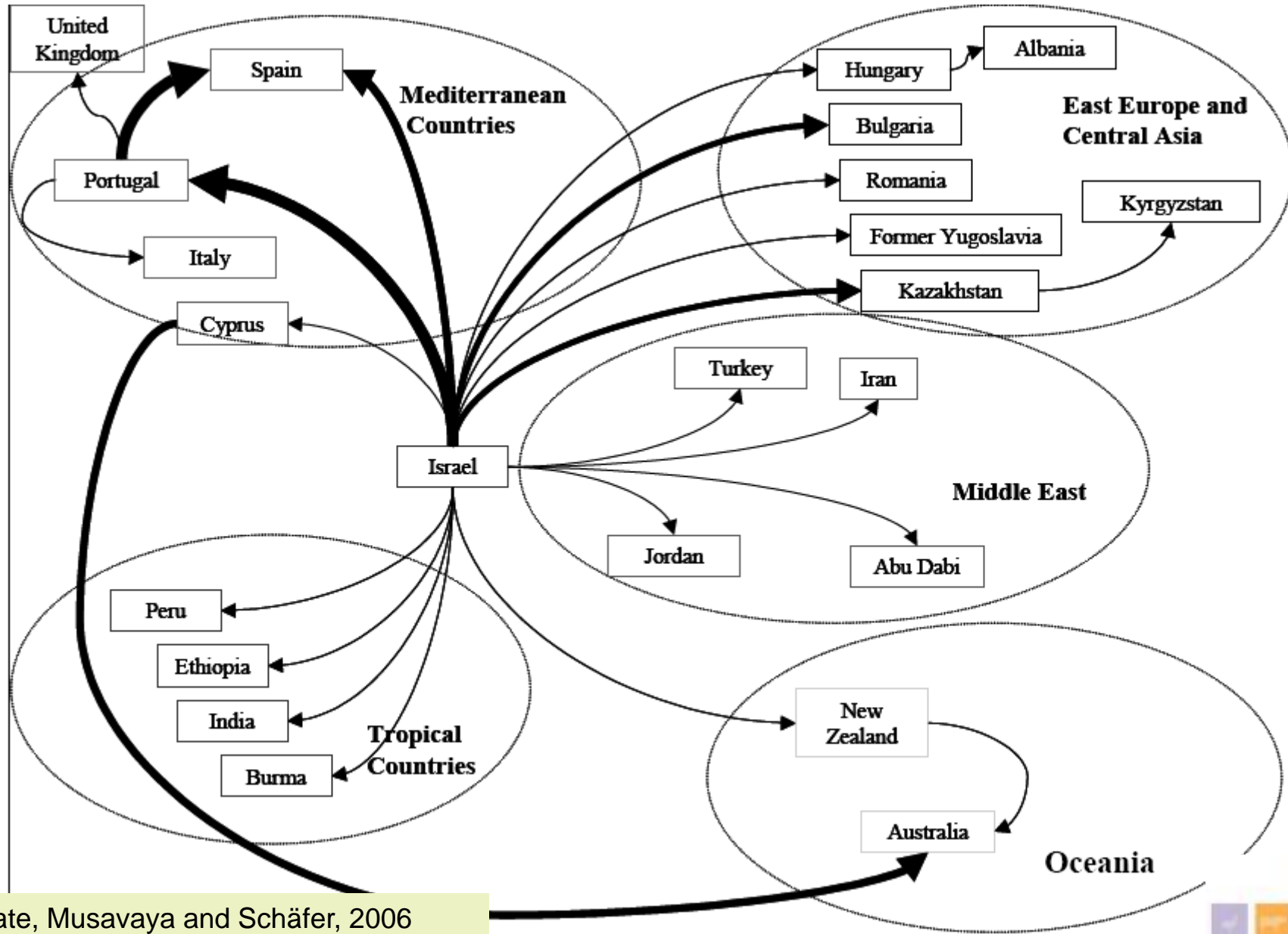
Assaf:5/8 Awassi 3/8 East Friesian



Gootwine, 2008



Gene flow of Awassi and Assaf



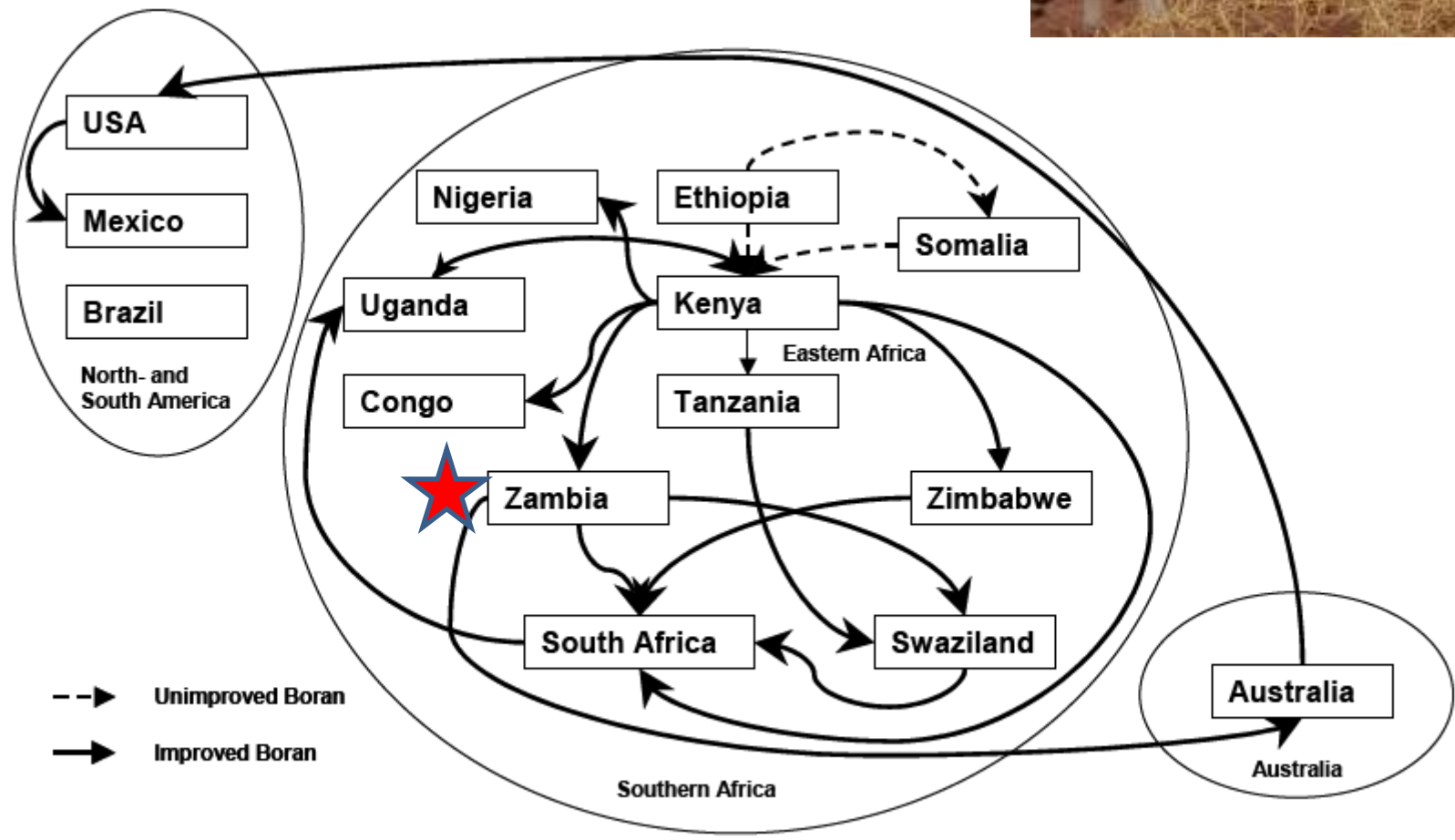


Boran





Transfer of Unimproved & Improved Boran cattle breeding material from Eastern and Southern Africa





Tuli

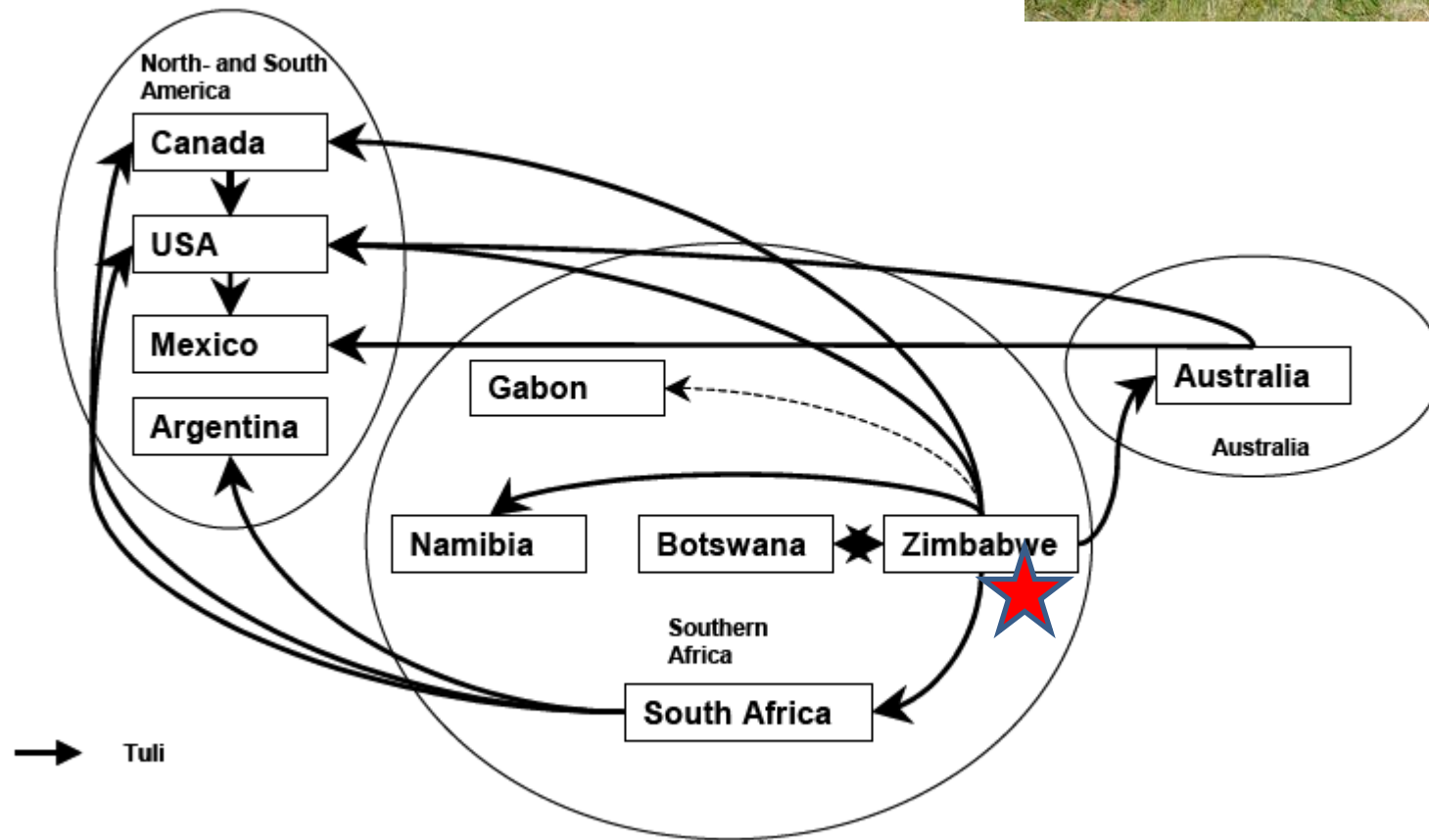


(Tuli Breeders Society of South Africa , 2012 <http://www.tulicattle.co.za/?p=24>)



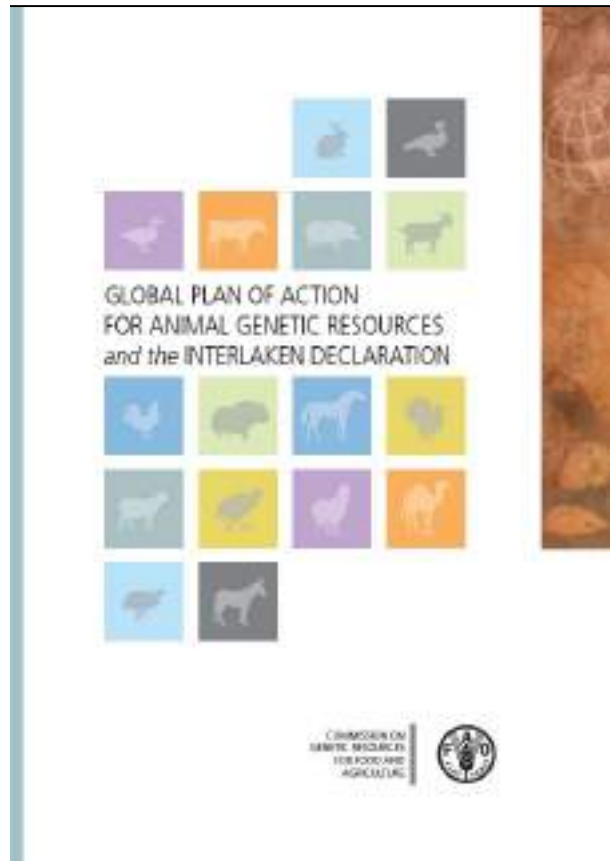


Transfers of Tuli cattle breeding material from Southern Africa





GPA: a soft international agreement renewed commitment to implement



2007

Interlaken Conference



2017

CGRFA and FAO Conference





Why do we exchange AnGR?

Welsch, E. J., Anim. Breed. Genet. 129 (2012)

For the livestock sector, there are three integrated contexts in which genetic resources are exchanged and used that may be affected by a new ABS regime:

- Market (breeding, multiplication, production, conservation)
- Research
- Culture

Exchange of AnGR is beneficial and smoothly running





Commercial trade in AnGR



http://www.google.pl/search?hl=pl&site=img&tbm=isch&source=hp&q=cattle+auction&btnG=Wyszukiwanie+obrazem&biw=1024&bih=768&as_srp=1&as_srp=1
=MN21UdKrF7H14QSE24Ew





American Breeders Service

The screenshot shows a web browser window with the URL <https://absglobal.com/us/#>. The website has a dark blue header with navigation links: TRANSLATE, COUNTRY, NEWS, CONTACT, GLOBAL, and a search bar. Social media icons for Facebook, Twitter, LinkedIn, and YouTube are on the right. A dropdown menu for 'COUNTRY' is open, listing various regions including Argentina, Australia, Brazil, Canada-EN, Canada-FR, Chile, China, Colombia, Germany, India, Italy, Mexico, Poland, Russia, and USA. Below the navigation, there are links for Beef, Uddercare, ABS Store, Bull Search, and Company. On the right side, there are links for Beef Bull Search and Dairy Bull Search. The main content area features a large advertisement for 'BEEF IN FOCUS' with the headline 'Beef on Dairy... But not as you know it'. The ad includes a list of benefits: Beef Genetics Created Specifically for Dairy Herds, Proven Performance on Dairies, and Beef Supply Chain Marketability. The ABS logo is visible in the bottom right of the ad. The Windows taskbar at the bottom shows the search bar with the text 'Wpisz tu wyszukiwane słowa' and the date '11.08.2019'.



ABS Polska

The screenshot shows a web browser window with the URL abspolska.com.pl. The browser's address bar contains several tabs: "Mail - Elzbieta", "(86) Facebook", "https://spin...", "Genus ABS", "ABS Global - A...", "ABS Global - A...", "ABS POLSKA", and a plus sign for more tabs. The website header features the "Genus" logo (a red crescent moon) and the "ABS Polska" logo (a blue square with "ABS" in white and "Polska" in red below it). To the right of the logos is the slogan "GENUS. LONG LIFE COWS." and a search bar with the placeholder text "Szukaj...". Below the header is a navigation menu with the following items: "HOME", "BYDŁO MLECZNE", "BYDŁO MIĘSNE", "PIELĘGNACJA WYMIENIA", "SERWIS TECHNICZNY", "ABS POLSKA", and "AKTUALNOŚCI". The main content area is dominated by a large advertisement for "Sexcel". The ad has a dark blue background with a close-up of a person's face wearing glasses. A red diagonal banner in the top left corner of the ad reads "Prezentujemy". The word "Sexcel" is written in large, bold, red and blue letters. Below it, in a white box, is the text "Sexed Genetics". At the bottom of the ad, the slogan "Fast Forward Your Genetic Progress™" is written in white. To the right of the main ad is a smaller, dark blue box with white text that says "Dowiedz się więcej...". At the bottom of the browser window, the Windows taskbar is visible, showing the search bar with the text "Wpisz tu wyszukiwane słowa" and several application icons. The system clock in the bottom right corner shows the time "23:08".

The Pig Site

EuroTier Digital
Out November 2014
Click here to sign-up



- Home
- News & Analysis
- Features
- Markets & Reports
- Knowledge Centre
- Business Directory
- Events
- Our Shop

News



Strategic Porcine Multiplication Agreement in China

22 September 2014

CHINA - Genus plc has a new strategic agreement with River Stone Farm (Shandong) Co., Ltd to become the Group's first commercial multiplier in China.

Riverstone is a joint venture between Black River Capital Partners Food Fund Holdings (Singapore) Pte Ltd ('Black River') and Pipestone System, a leading US pig management company.

Under the terms of the multi-year agreement, Genus's porcine genetics division, Genus PIC, will exclusively stock and sustain Riverstone's new pig production project

Share This



Our Sponsor



News By

Please Select Advertiser

Please Select Country

Please Select Category



Related News

Profit Growth by PIC Helps Genus Annual Results

10 October 2014

Cano Named as PIC's North American Director of Health Assurance





PIC in China

The screenshot shows a web browser window with several tabs open. The active tab is titled "PIC China makes milestone shipment to Shennong-1". The address bar shows the URL "thepigsite.com/news/2017/10/pic-china-makes-milestone-shipment-to-shennong-1". The main content of the page is a news article with the following details:

- Section-Header:** PIC China makes milestone shipment to Shennong
- Category:** COMPANY/PRODUCTS
- Author:** by 5m Editor
- Date:** 3 October 2017, at 12:00am
- Text:** Yunnan Shennong Agricultural Industry Group (Shennong) has recently imported more than 1,000 elite, high-health great grandparent (GGP) from The PIG Improvement Company (PIC).
The shipment of elite pigs is a major milestone in PIC China's partnership with Shennong, an integrated pork producer and one of the most progressive pig farming companies in China. It involved transporting 1,000 GGP gilts from PIC's genetic nucleus facilities in North America and delivering them to Shennong's facility. The animals recently completed a 45-day period of quarantine and are now being integrated into Shennong's nucleus herds.

On the right side of the page, there is a "SPONSORED ARTICLE" section titled "PIC". Below it is a "OUR SPONSORS" section featuring logos for various companies: HERRA, The Reference in Prevention for Animal Health, Boehringer Ingelheim, Big Dutchman, zoetis, CEVA, HOBISLAT, Biomin, and MSD Animal Health. At the bottom right, there is a "PARTNERS" section listing: CID LINES, Genesis, Evonik, Adisseo, Hypor, Novus International, and Thermo Fisher Scientific, PIC.

At the bottom of the browser window, the Windows taskbar is visible, showing the search bar with the text "Wpisz tu wyszukiwane słowa" and several application icons. The system tray shows the time as 22:48 and the date as 11.08.2019.





PIC in China

Mail - Elżbieta Marczyniuk | (36) Facebook | https://cpin.sgqa.pl/webn... | Home | PIC | Genus plc partners with BC...

nationalhogfarmer.com/business/genus-plc-partners-bca-progress-prrsv-resistant-pigs-china

National Hog Farmer [Search] [Register] [Log in]

Business | Animal Health | Livestock Facilities | Marketing | Our Events

Quick online accreditation for agriculture professionals. **Ag CEU Online** BROWSE THE FREE COURSES

U.S.-China trade war continues to escalate
AUG 09, 2019

Genus plc partners with BCA to progress PRRSv resistant pigs in China

The initial phase of the collaboration is expected to take several years and focuses on the research, development and regulatory approval in China of PRRSv resistant pigs.

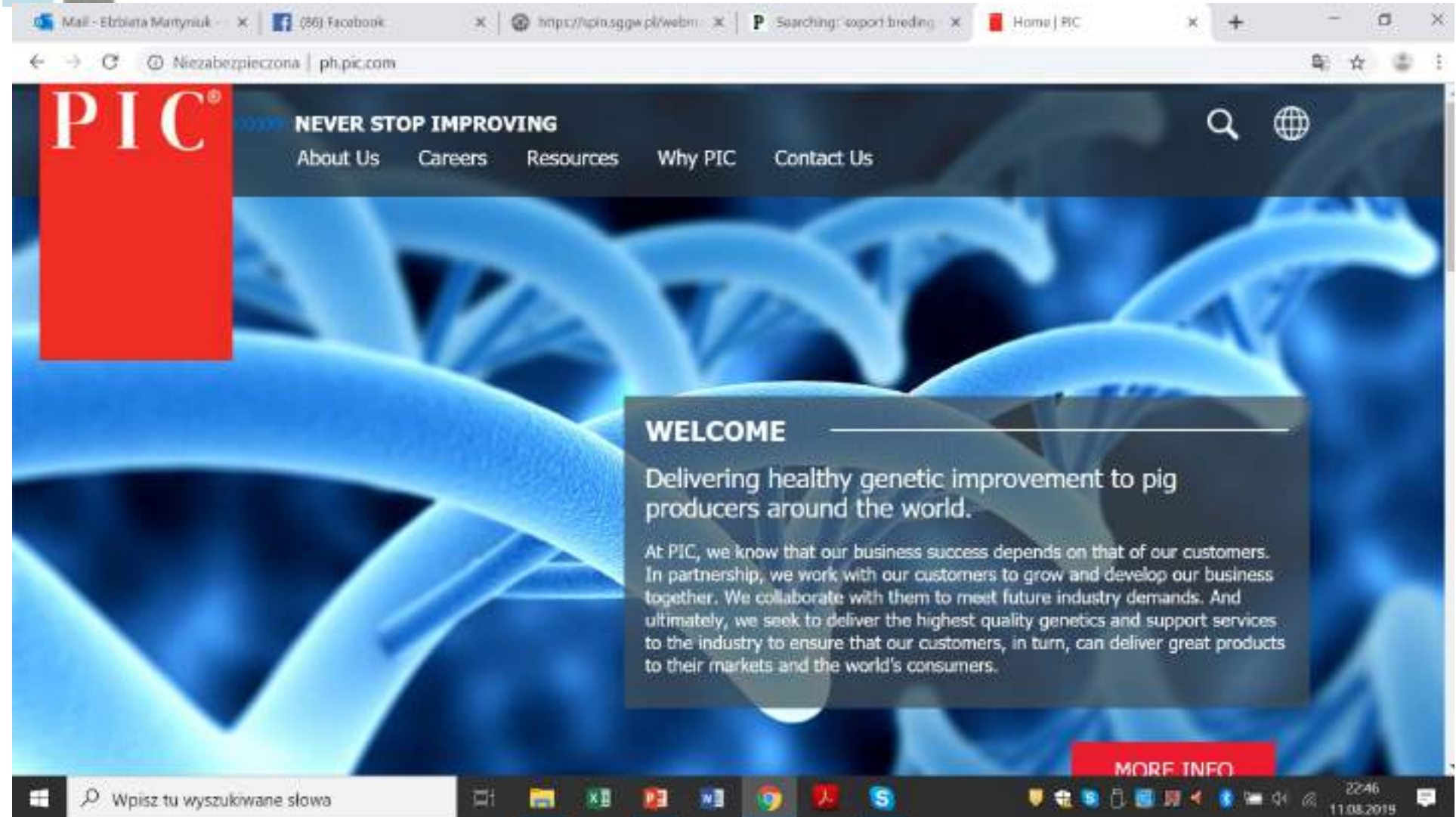
May 16, 2019

Wpisz tu wyszukiwane słowa | 22:55 | 11.08.2019

PRRS: Porcine reproductive and respiratory sy



PIC in Thailand



The image is a screenshot of a web browser displaying the PIC website. The browser's address bar shows the URL <https://ph.pic.com>. The website header features the PIC logo on the left, the slogan "NEVER STOP IMPROVING" in the center, and navigation links for "About Us", "Careers", "Resources", "Why PIC", and "Contact Us" on the right. The main content area has a blue background with a glowing DNA double helix. A dark grey box in the center contains the following text:

WELCOME

Delivering healthy genetic improvement to pig producers around the world.

At PIC, we know that our business success depends on that of our customers. In partnership, we work with our customers to grow and develop our business together. We collaborate with them to meet future industry demands. And ultimately, we seek to deliver the highest quality genetics and support services to the industry to ensure that our customers, in turn, can deliver great products to their markets and the world's consumers.

A red button labeled "MORE INFO" is located at the bottom right of the main content area. The Windows taskbar at the bottom shows the search bar with the text "Wpisz tu wyszukiwane słowa" and the system tray displaying the time "22:46" and date "11.08.2019".



aktadki Narzędzia Pomoc

ter.com/longform/money/agriculture/2014/10/15/feeding-china-iowa-eggs-day-five

Google

HOME NEWS SPORTS THINGSTO DO BUSINESS OPINION MORE

Feeding China: Iowa firm helps hatch egg industry expansion

WEST DES MOINES-BASED HY-LINE INTERNATIONAL HOPES TO PLAY BIG ROLE AS CHINA MOVES TOWARD U.S.-STYLE MEGA-OPERATIONS.

Lynn Hicks, lhicks@dmreg.com

Every year, about 250,000 chicks make a 7,000-mile journey from central Iowa to China.



Start 2 Microsoft Outl... 3 Firefox 2 Microsoft Pow... 15:31



Sells all over the world

The screenshot shows a web browser window displaying the Hy-Line website. The page title is 'Locations' and it includes a navigation menu with links for Home, Product Information, Locations & Distributors, Animal Welfare, Our Science, and About Us. The main content area prompts the user to 'Please click on the region or country below' and features a list of African countries under the heading 'Africa'. A world map is also visible, with the African continent highlighted in dark blue.

Locations

Please click on the region or country below

Africa

- [Algeria](#)
- [Angola](#)
- [Botswana](#)
- [Burkina Faso](#)
- [Cameroon](#)
- [Cote d'Ivoire](#)
- [Egypt](#)
- [Ethiopia](#)
- [Ghana](#)
- [Ivory Coast](#)
- [Kenya](#)
- [Liberia](#)
- [Libya](#)
- [Malawi](#)
- [Mali](#)
- [Mauritius](#)
- [Morocco](#)
- [Nigeria](#)
- [Rwanda](#)
- [Senegal](#)
- [Sierra Leone](#)
- [South Africa](#)
- [Sudan](#)
- [Tanzania](#)
- [Tunisia](#)
- [Uganda](#)
- [Zambia](#)
- [Zimbabwe](#)





US trade value of AnGR in 2018 (USD)

AnGR	IMPORT	EXPORT
Purebred breeding cattle: live	3,556,520	76,960,782
Cattle semen	37,025,000	190,306,369
Purebred breeding pigs: live	666,770	13,876,109
Chicken below 185g	8,746,680	203,491,176
Turkeys below 185g	24,739,975	12,607,230
Fertilised eggs for incubation: chicken	19,790,373	315,184,649
Fertilised eggs for incubation: other poultry species	26,420,068	9,649,282
TOTAL USD	120,975,386	819,075,598

In 2011, the USA exported **\$664 million** worth of breeding stock and genetic material

<https://comtrade.un.org/data>



Import of semen to the USA: 37,025,000

UN Comtrade Database

Period	Trade Flow	Reporter	Partner	Commodity Code	Trade Value (US\$)	Netweight (kg)	Qty Unit	Qty	Flag
2018	Export	Mexico	USA	051110	\$7,804	1	Weight in kilograms	1	0
2018	Export	Australia	USA	051110	\$202,098	0	No Quantity	0	4
2018	Export	Canada	USA	051110	\$32,833,274	0	No Quantity	0	4
2018	Export	Czechia	USA	051110	\$2,929	1	Number of items	250	0
2018	Export	Denmark	USA	051110	\$54,357	0	Number of items	0	4
2018	Export	France	USA	051110	\$1,444,272	0	Number of items	0	4
2018	Export	Germany	USA	051110	\$189,559	7	Number of items	44,170	0
2018	Export	Hungary	USA	051110	\$31,883	8	Number of items	31,893	0
2018	Export	Ireland	USA	051110	\$6,687	54	Weight in kilograms	54	0
2018	Export	Israel	USA	051110	\$2,000	0	No Quantity	0	4
2018	Export	Italy	USA	051110	\$55,320	4	Number of items	3,503	0
2018	Export	Netherlands	USA	051110	\$1,365,760	5,567	Number of items	242,053	0
2018	Export	New Zealand	USA	051110	\$183,526	0	No Quantity	0	4
2018	Export	Norway	USA	051110	\$211,946	30	Weight in kilograms	30	0
2018	Export	Slovakia	USA	051110	\$7,083	1	Number of items	6,000	0
2018	Export	Sweden	USA	051110	\$43,394	0	Number of items	7,901	4
2018	Export	Switzerland	USA	051110	\$32,033	4	Number of items	66	4
2018	Export	United Arab Emirates	USA	051110	\$10,069	25	Weight in kilograms	25	0
2018	Export	United Kingdom	USA	051110	\$187,307	217	Number of items	18,755	0
2018	Export	United Rep. of Tanzania	USA	051110	\$10,757	97	Weight in kilograms	97	0

Showing 1 to 20 of 20 entries

First Previous 1 Next Last



Commercial trade in AnGR

- When selling animal genetic material (breeding animals, semen, embryos, fertilised eggs for incubation...)– the value of this material as a genetic resource is reflected in its price– the buyer usually is free to use it for further research and breeding
- **The price** of animals in fact **includes a benefit-sharing agreement**: the owner/supplier gets money in exchange for providing access to the genetic material
- In some case parties may agree on restrictions on the further use of breeding material and its transfer to third parties, either through contracts or through “gentlemen’s agreements”.

(FAO, 2009; Schloen *et al*, 2011)



4th IMAGE DIALOGUE FORUM



European Project n° 677353



Impact of the ABS measures

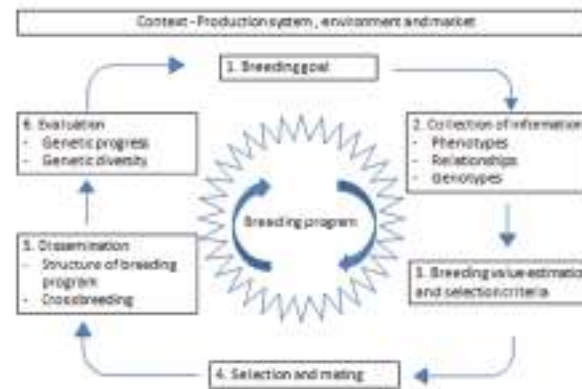
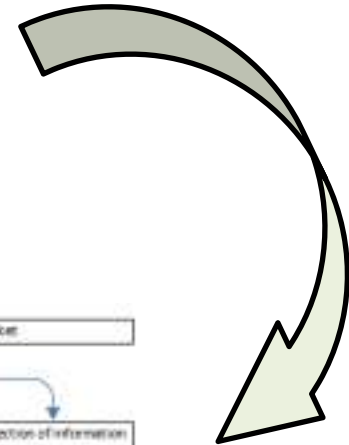




When ABS legislation becomes relevant?

Introduction from a country regulating access!

- New breeds/lines
- Individual breeding animals
- Any type of genetic material



Adapted from: H. Hübner, Animal Breeding and Genomics Centre, Hohenheim University and Research

Users have to comply with national legislation of the Provider country!
and fulfill obligations arising from the EU ABS law, if relevant





Impact of ABS measures: BREEDING

- Mainstream breed genetic improvement programmes are carried out within selected populations (breeding industry, cooperatives, farmers in national programmes)

At present no need for exotic AnGR (from provider countries in the south) to continue genetic progress in mainstream breeds

BUT

- Transboundary European breeds or imported breeds may require influx or exchange of breeding material
- Some European countries introduced access legislation
 - livestock GR is exempted from access measures (FR & ES)
 - other countries: not always clear
- Future needs? Resistance to diseases /adaptation to climate





Impact of ABS measures: CONSERVATION

In case of endangered transboundary breeds

- If there are national ABS measures in one country where the breed is present
 - Access to breeding stock / reproductive material might be more difficult
 - Collection of samples for *ex-situ* conservation might be more difficult
 - Developing joint strategies for conservation might be more difficult

AnGR conservation activities are usually undertaken and implemented at the national level, so potentially single difficult cases only





Svalbard
Norway



Impact of ABS measures: GENEBANKS



BioBank Norway





AnGR GENE BANKS

- Animal genebanks quite difficult to manage:
 - ✓ Type of genetic material
 - ✓ Storage requirements
- Still a limited number of operational national genebanks (in public domain) to conserve AnGR
- Animal genebanks are mainly in Europe, growing in number
- Ownership of the genetic material
 - Stays with the owner of the donor animal (AU, FR)
 - Transferred to the genebank (NL, PL)





Impact of ABS measures: GENE BANKS

Need to:

- Document source of material that is introduced to the genebank
- Store this information and make it available for users
- Develop protocols and procedures for exchange of biological material
 - between genebanks
 - transfer from genebank to users
- Adopt and implement voluntary best practices, that include:
 - Standard MAA **Material Acquisition Agreement**
 - Standard MTA **Material Transfer Agreement**





Exchange of AnGR for research

- Exchanges of AnGR (genetic/biological resources) are usually governed by scientific cooperation contracts
- Some research organisations developed own model contracts
- Each party keeps the property of its inputs in the project
- No other use allowed than specified in the project
- Confidentiality required
- The scientific results, publication and potential IPRs are shared
- Remaining genetic material taken care of (give back or destroy options)

Global research community considers the facilitated exchange of research material between countries of a major relevance

(Hiemstra *et al*, 2010)





Impact of ABS measures: RESEARCH

Research projects often require AnGR from countries regulating access to GR, including AnGR

- Need to follow requirements on access and benefit sharing of the Provider country: often require time and efforts
- Need to fulfil user obligations set by the EU ABS Regulation, if relevant
- Need to respect domestic ABS legislation of User country

The ABS legislation will have a highest impact on the European research sector





Impact of ABS measures: RESEARCH

When considering inclusion in the project AnGR from country regulating access one need to consider:

- Which Provider country should be chosen? if relevant
- What are access application procedure and requirements?
- What are experience of other users with accessing AnGR from this country?
- If all requirements are fulfilled (temporal, geographical and material) to be in scope of the EU ABS Regulation, if relevant

A decision where from access AnGR has to be carefully considered, as there are substantial differences in national ABS legislation and regulatory framework among Provider countries





Impact of ABS measures: Cultural exchange



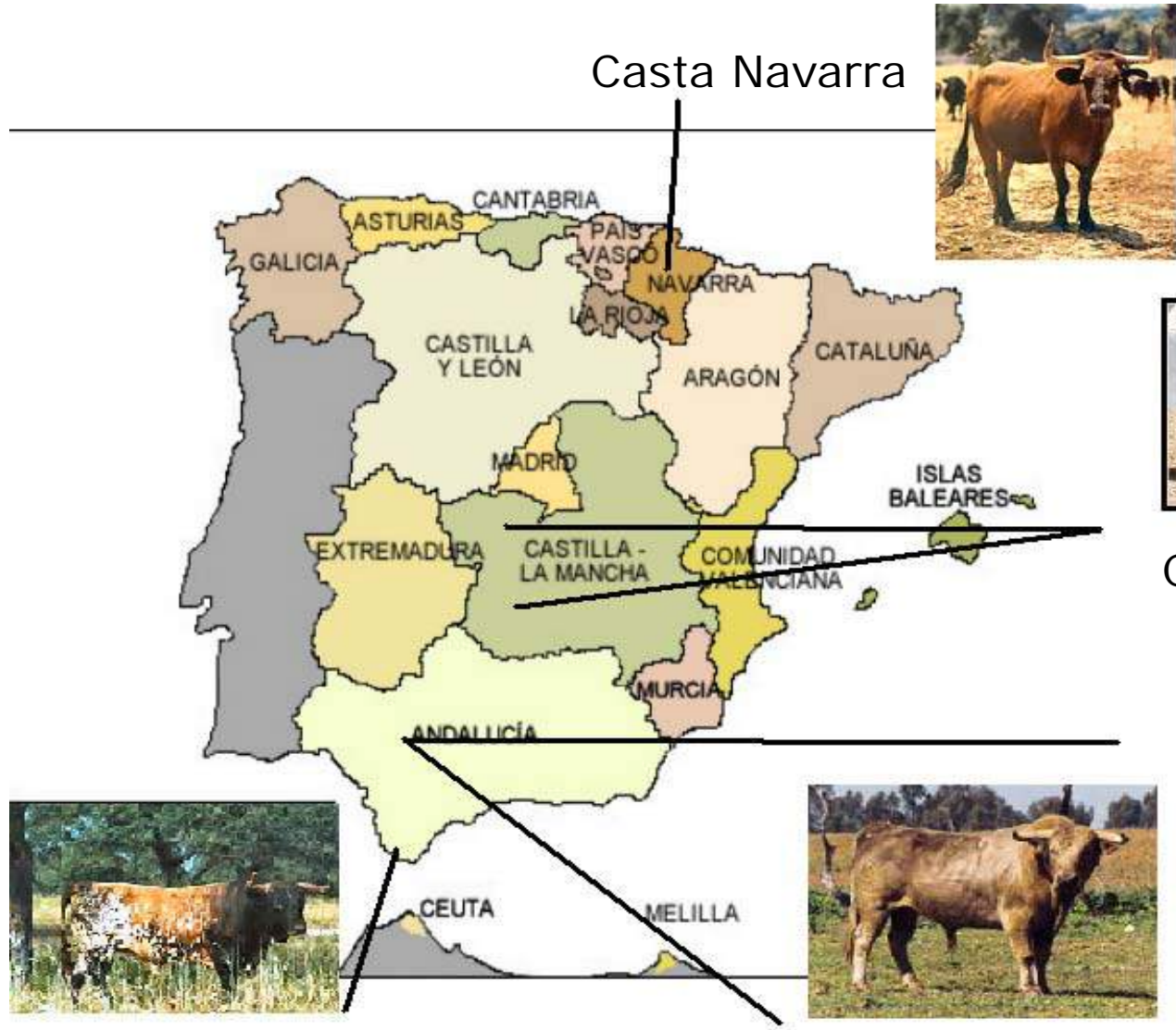
Valdostana castana





Conor Desmond Cleary,
Universidad Politecnica
de Madrid, 2013

Toro de Lidia



Casta Jijona



Casta Cabrera



Casta Vazqueña



Casta Vista hermosa





Cultural exchange

- Livestock farming is often a culturally embedded activity
 - A local breed is often strongly connected to farmer recognition of breed desirability and value
 - National governments and culture groups also identify strongly with particular livestock breeds
- It is not clear how cultural norms and practices will affect ABS implementation
 - Greater awareness of ABS may foster local initiatives
 - Cultural considerations could increase pressure on government to intervene in the market with ABS rules or regulations



ABS in IMAGE project

Two surveys have been conducted:

- As a part of a broad Genebank survey WP2:
 - ✓ ABS awareness
 - ✓ implementation of MAA MTA by AnGR Genebanks
- ABS National Competent Authorities:
 - ✓ National ABS measures for GRFA, and especially AnGR
 - ✓ Genebank specific measures in national legislation

Goal:

support Genebanks in their implementation of the ABS requirements



Conclusions: ABC of the NP and AnGR

AnGR Genebanks

Live animals/germinal products

Access

Relatively easy to regulate

Difficult to regulate! Ownership

Benefit sharing

Unclear:

- ✓ Bilateral arrangements?
- ✓ Benefits towards the Funding Strategy of the GPA?
- ✓ Article 10 of the NP?

At present:

- ✓ Bilateral private contracts
- ✓ Price of AnGR reflects its value
- ✓ No additional benefits

Compliance

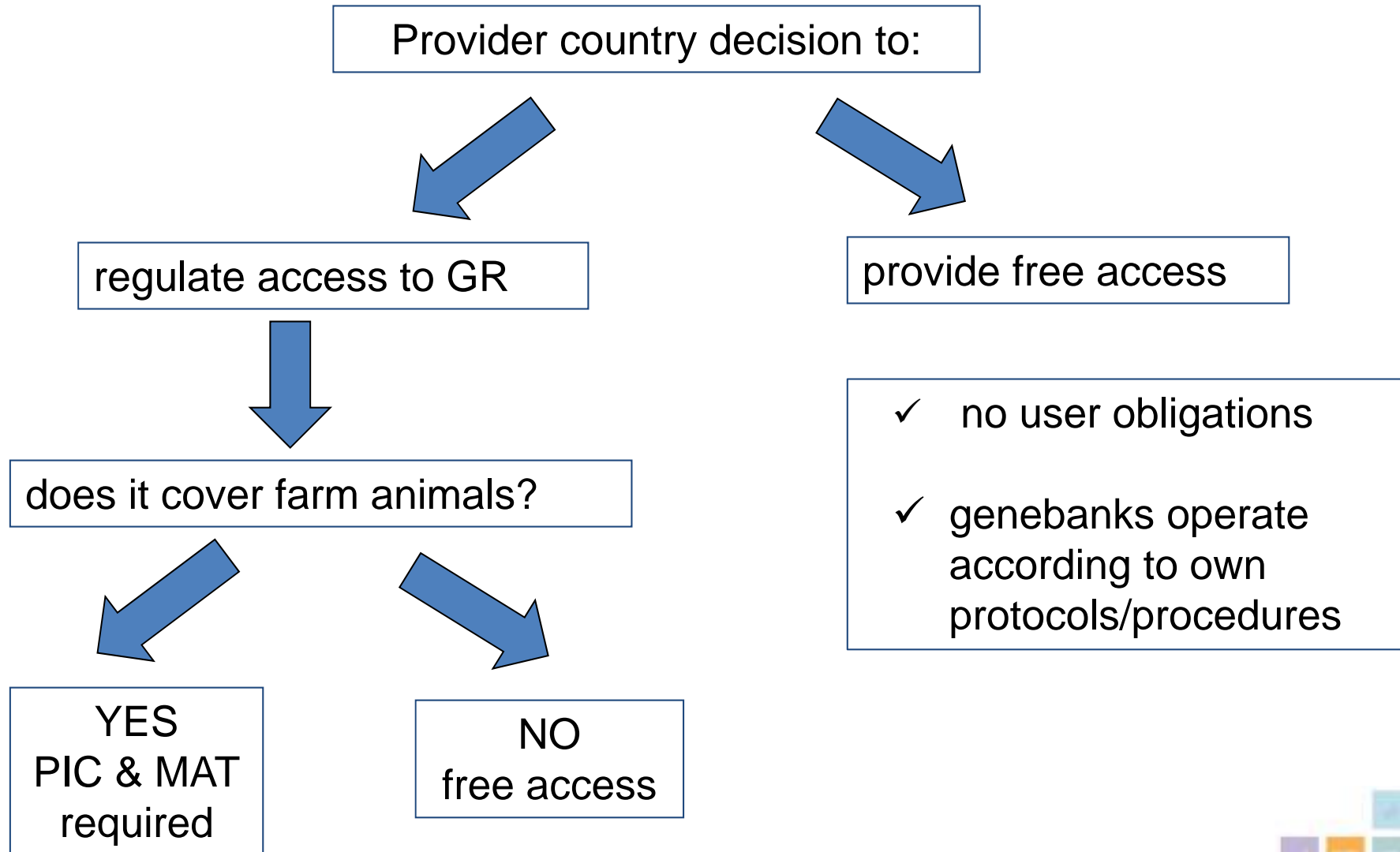
Subject to national legislation, check points and monitoring - **feasible**

Subject to national legislation, check points and monitoring - **difficult**



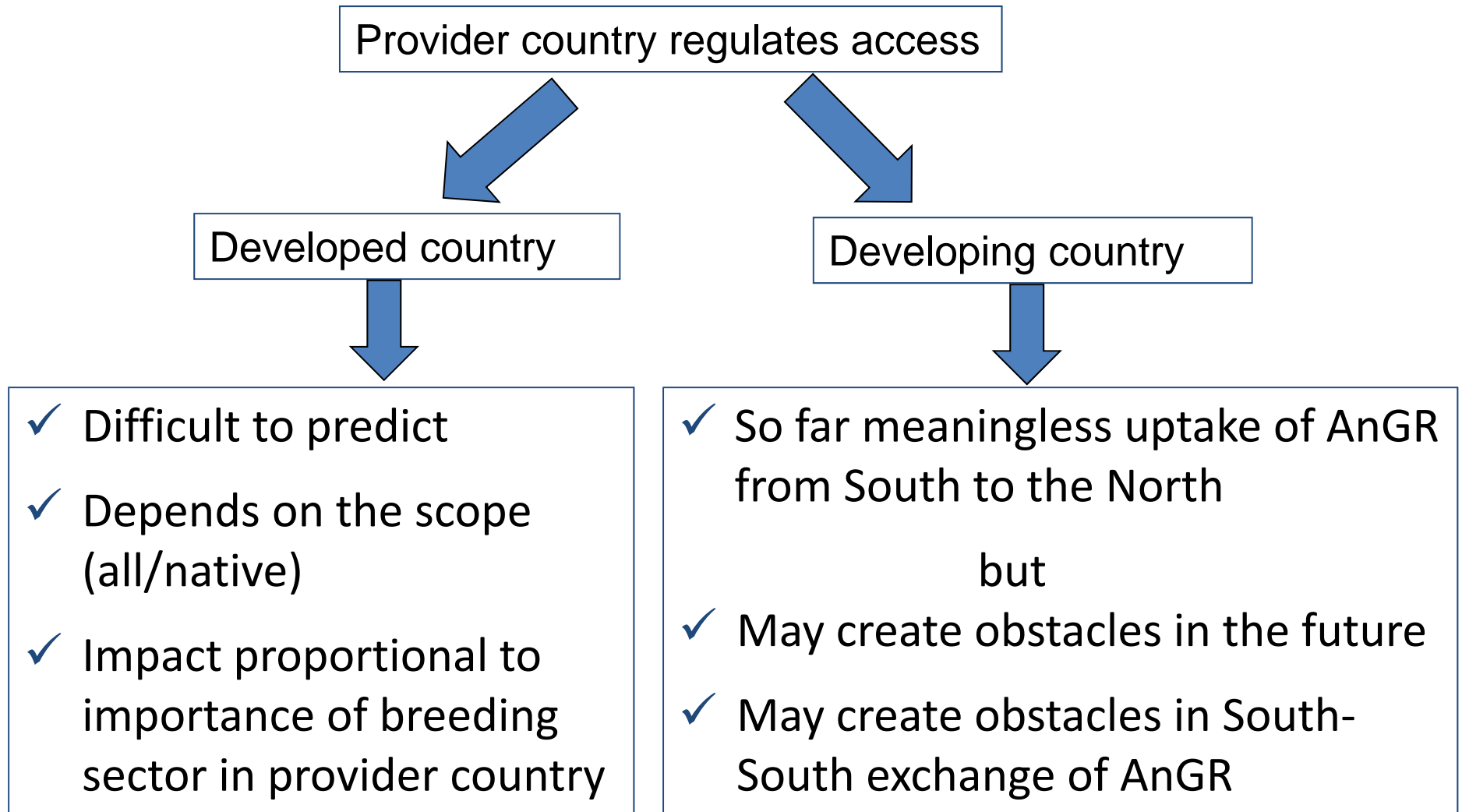


Impact on AnGR and Genebanks





Impact on AnGR and Genebanks



Research will be always affected



Different rules for different breeds?

Global trade in international breeds:

- Contribute to enhancement of livestock production, especially in developing countries
- Profitable for buyers
- Breeding companies usually do not expect additional benefits arising from utilisation of their breeding stock
- The price and ability to supply „products“ provides sufficient benefits

Exchange of native and locally adapted breeds

- that may have desirable traits for future breeding needs
- that may have unique cultural /social value

might be/will be a subject of ABS measures



Thank you for your attention

