

The National Program of Conservation and Utilisation Farm Animal Genetic Resources: cryoconservation program in practice



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Cryoprogram as an integral part of the National Program

Central genebank (general depot + duplicates)

2 regional banks (IDs, embryos of mammals)

1 regional bank (IDs of freshwater fish)

2 research institute banks* (DNA samples, tissues)

cryoprogram in operation since 1997

Cryopreserved material as of 01.01.2010					
species	breeds	embryos	IDs	sires	DNA samples*
cattle	2	1030	21200	27	(10 other breeds) 7400
horse	4	0	2280	47	1100
pig	2	0*	960	67	somatic cells
goat	2	0	485	24	(5 other breeds) 1800
sheep	2	0	1330	73	(12 other breeds) 5600
poultry	6	0	0	0	1030
<i>freshwater fish (7species)</i>	<i>24 lines</i>	<i>0</i>	<i>3500</i>	<i>480</i>	<i>tissues</i>

Cryoprogram in practice
1. breed regeneration: Czech Red cattle

Breed reconstruction by cryoconserved reproduction material



Kalina 1968

1996

1st herd = 14 female founders + 2 sires, half-sibs (ID) born 1984- 1992
Polish red (IDs)1996

in situ + embryos (n=135) 1997

genebank

2nd herd in situ
1997

2003
-2005

IDs permanently
over all herds

Part of 1997's
embryos

IDs, new
embryos

2005
-2009

conservation
nucleus 2008

Live animals

2010 :
6 dams + 3sires

2010: 10 farms, 140 dams, 6 sires



ET babies
2008

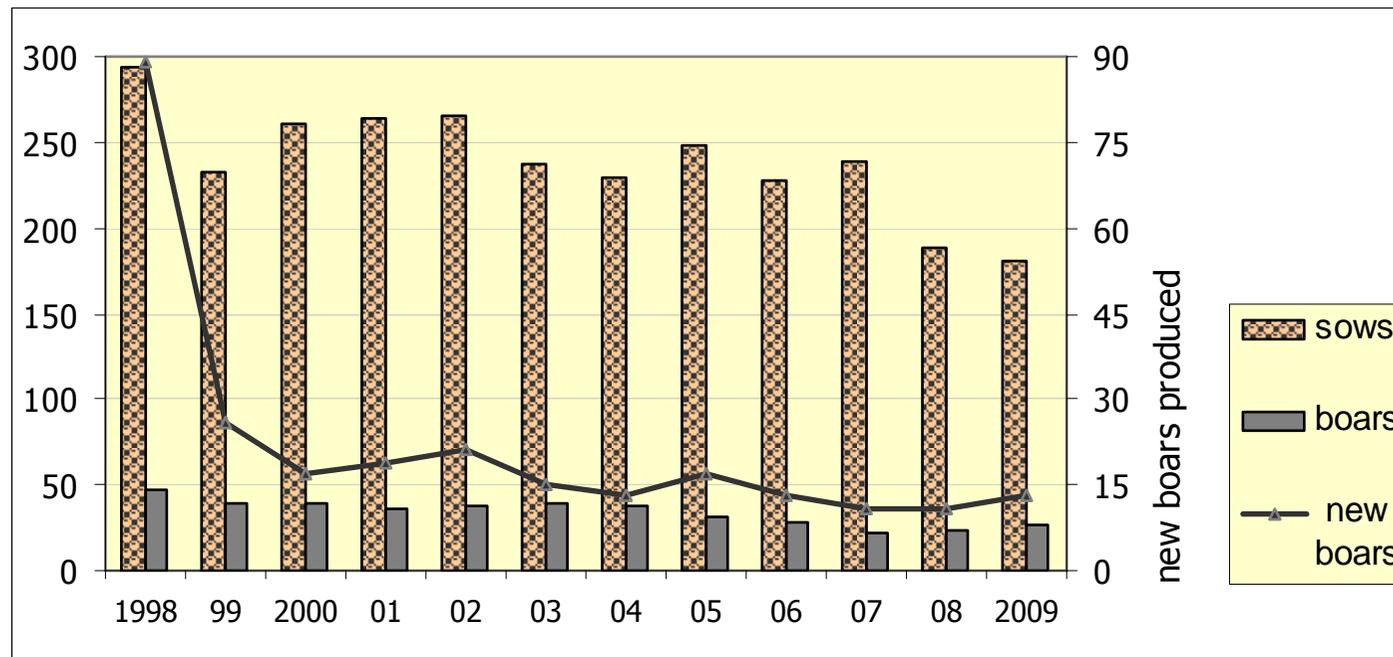


2010

2. Managing intra-breed diversity

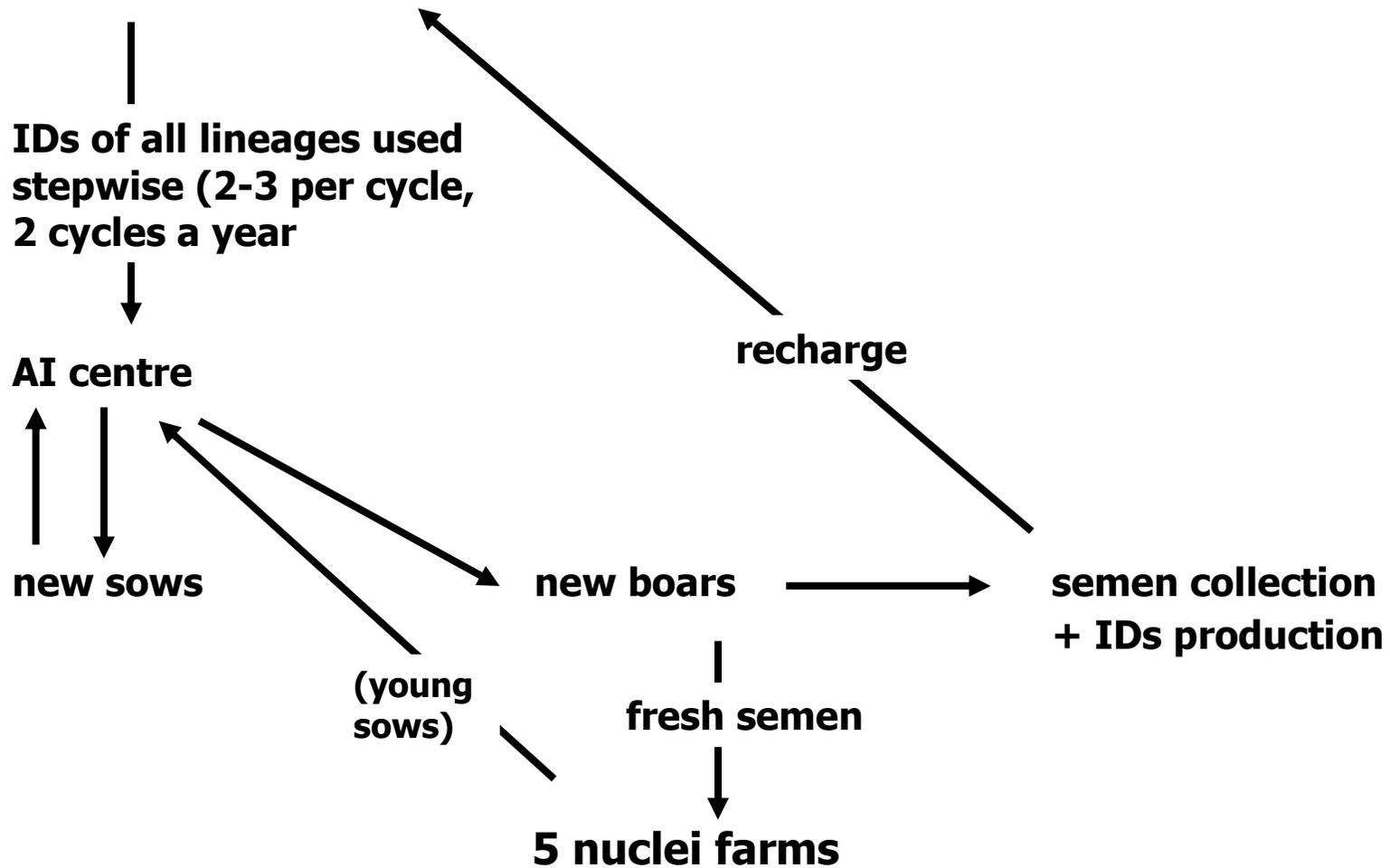
**Prestice pig: 2008 in situ 5 farms only
breeding nucleus: 350 sows, ~ 30 boars,
few new boars produced on farms
decline of intra-breed diversity**

**AI centre produces new boars
of all former parental lineages
to bring them back into breeding**



Renewal of pig parental lineages

Genebank - since 1998 all the 11 original parental lineages stored (IDs)



3. cryoconservation IDs and embryos based on monitoring population trend – Czech Red-pied cattle (CESTR)

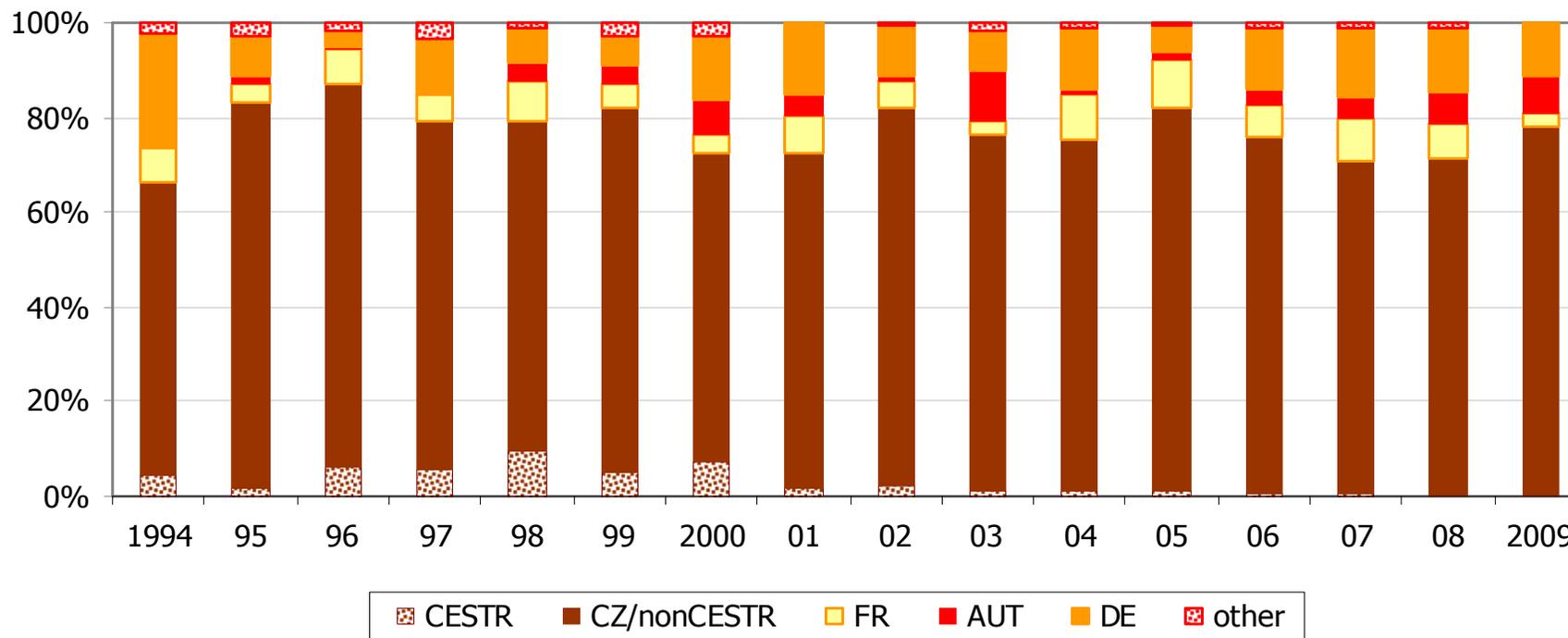


Red-pied in the CR: 35-40000 dams, 200-130 new sires registered annually

Population consists of:

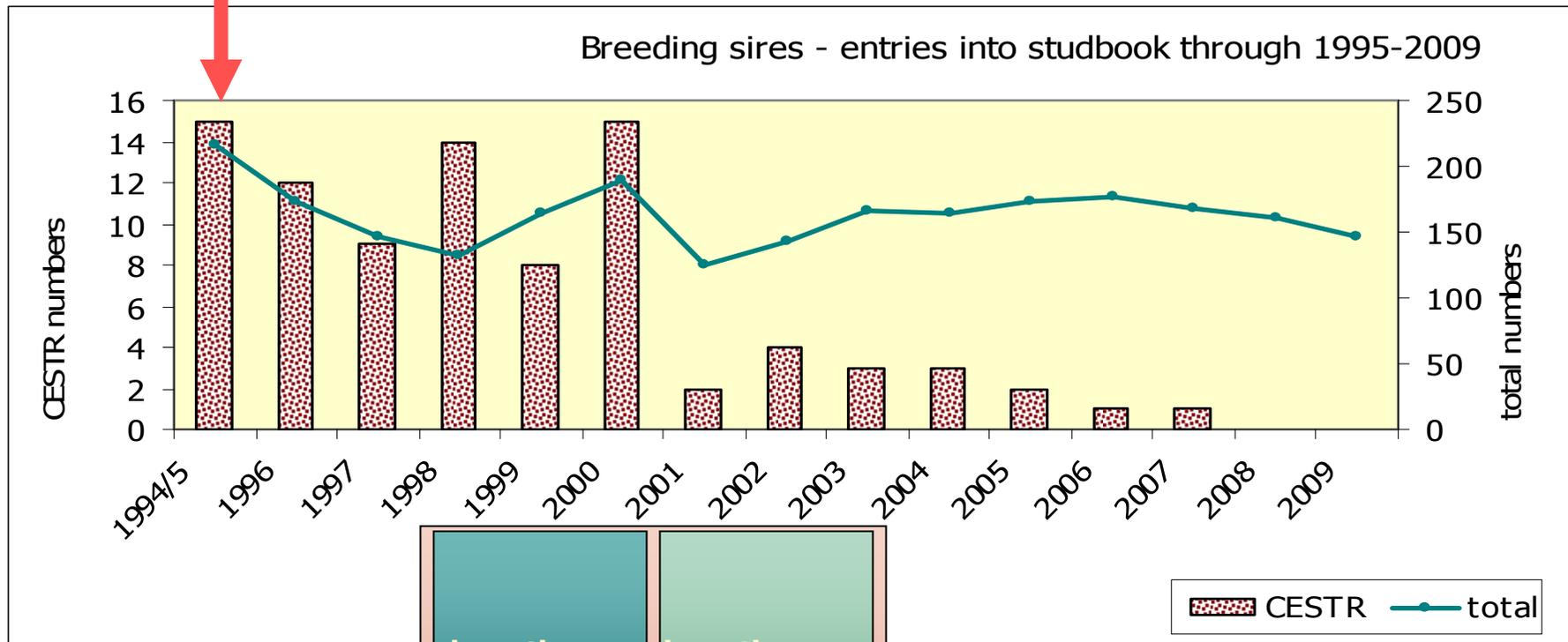
- old-type CESTR, not improved by other red-pied breeds
- imported sires (+IDs) – FR,DE,AUT,CH, I, SLO,SK,SE – since 1990's
- and their progeny (CZ/nonCESTR)

Proportion of old CESTR, CZ/nonCESTR, and imported sires entering stud book



Monitoring numbers of CESTR sires and cryopreservation procedure

start of massive imports red-pied semen (FR, DE, AUT, CH and other)



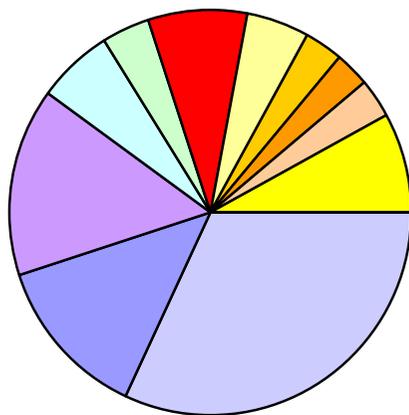
incentive pay for rearing new CESTR sires

incentive pay for rearing defined CESTR sires for IDs production

incentive pay for production CESTR IDs and defined embryos

since 1998
12400 IDs (22 sires)
and 950 embryos
(29 other sires + 114 donor dams)
collected
project finished in 2004

AI bulls (sire lines) 2005

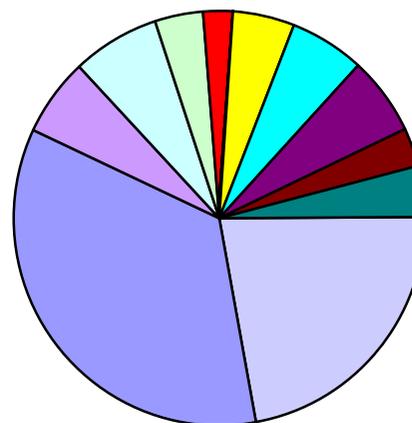


8%

- Radi
- Honig
- Unaf
- Bavor
- Aimant
- 5 Mrak
- Morelo
- Bajer
- Egel
- Helios
- ostatní
- Balda
- Nicou
- Redkan
- Redez

What next? Permanent monitoring (sires used in AI):

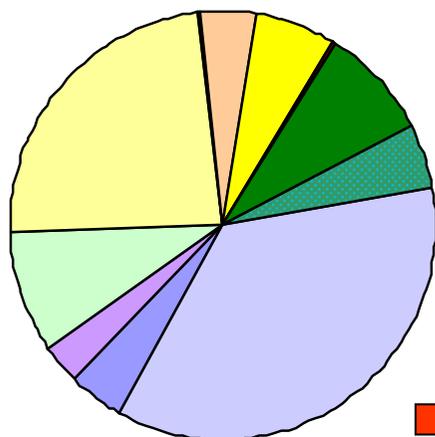
AI bulls (sire lines) 2007



2%

- Radi
- Honig
- Unaf
- Bavor
- Aimant
- 5 Mrak
- Morelo
- Bajer
- Egel
- Helios
- ostatní
- Balda
- Nicou
- Redkan
- Redez

AI bulls (sire lines) 2009



0,1%

- Radi
- Honig
- Unaf
- Bavor
- Aimant
- Mrak
- Morelo
- Bajer
- Egel
- Helios
- ostatní
- Balda
- Nicou
- Redkan
- Redez
- Tartars
- Bach



2009 last ~100 cows
of old CESTR type

creation of *in-situ*
conservation nucleus

**It is never too early to set in cryoprogram,
even if you are clear about
having enough animals in vivo (in situ)**

