

# Poultry biodiversity preservation strategies in France



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**Biological diversity or biodiversity** is the term given to the **variety within** and **between species** and the ecosystems within which they live and interact.

**Genetic diversity** refers to the **variety of genes within a species**. Within a species there may also be discrete populations with distinctive genes.

**To conserve the genetic diversity within a species, different populations must be conserved.**





## Providing technical expertise to poultry and aquacole breeding companies:

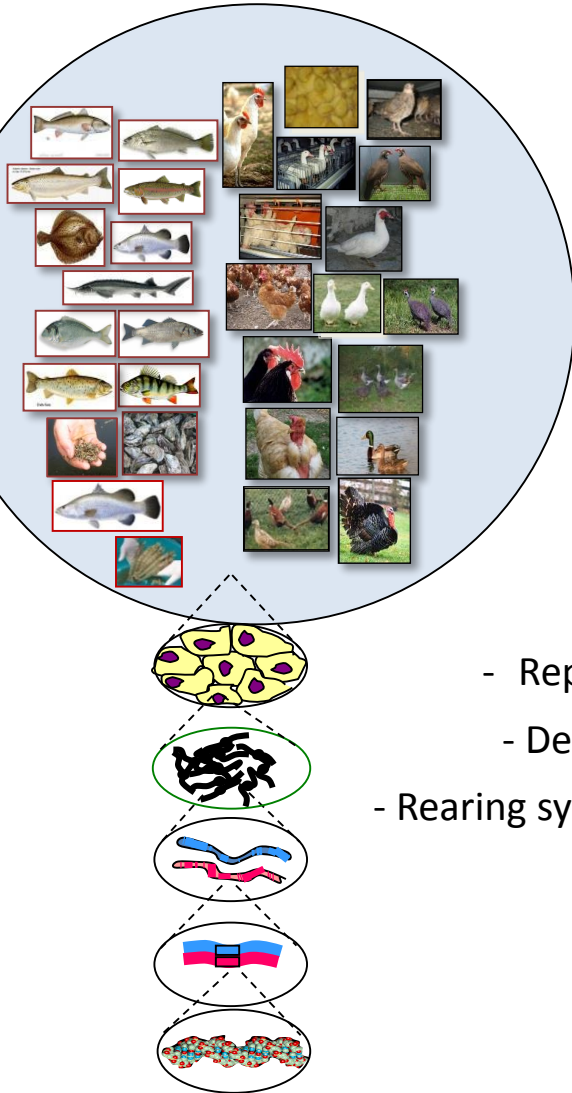
by delegation of ITAVI, for a specific list of species validated by the CNAG (National commission for genetic improvement).

### ➤ Support for the implementation of dedicated genetic programs :

- Design of breeding programs and broodstock genetic management,
  - Data storage and genetic data treatment ("Herdbook"),
  - Breeder choice for the next generation (n+1),
- Mating scheme proposals in order to minimize inbreeding,

### ➤ Support through secondary technical services :

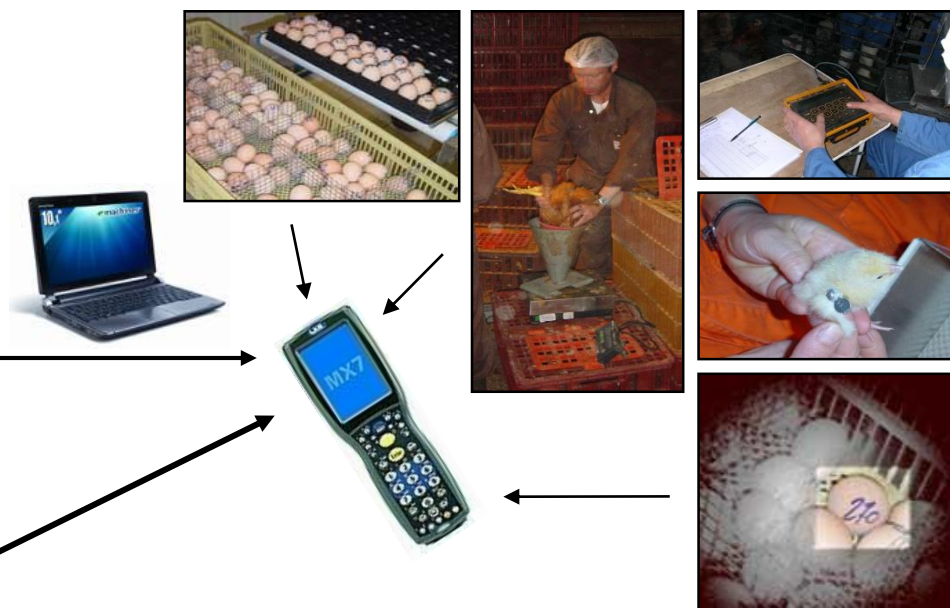
- DNA parental assignment,
- Dedicated analysis (Modélisation, simulation, etc...),
- Reproductive biotechnologies (Cryopreservation, Monosexing, sterilisation),
- Dedicated R & D programs to set-up technical Innovative strategies or tools,
- Rearing system, management and sanitary status of GP stocks audits (Label Rouge),
  - Access to technical platforms [*cryobank, genotyping, ploidie control*],
- Literature survey.



# SYSAAF : Technical support for the implementation of dedicated genetic programs



**“Breeding sites”**  
 Rearing  
 Pedigree reproduction  
 Incubation & hatching  
 Data collection  
 Data transfer



**Central SYSAAF  
 Database  
 (Data storage)**



Internet  
 network



Internet  
 or  
 Local network

**SYSAAF**  
 [Treatment chain]  
 (Koala & OptivarPack)



Data treatment  
 Breeder choices  
 Mating shame  
 Genetic diversity

## Poultry biodiversity:

- 10 Avian species being raised and the object of genetic selection programs in France.
- 130 poultry populations of 9 avian species taken in charge by SYSAAF in 2014.

## Poultry biodiversity within species:

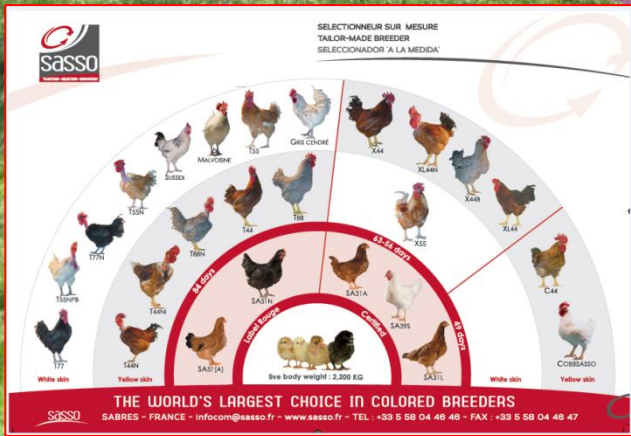
- Commercial lines: Pure lines & strains (intercross),
- Local pure breeds,
- Experimental lines (INRA - over 50 populations):
  - Divergent lines (Gallus, quails),
  - gene pool reservoir (genes of interest).

**To conserve the genetic diversity within a species, different populations must be conserved.**





# SYSAAF : Technical support dedicated to Label Rouge"strains"



Code of practice RefAvi® SYSAAF: "Mode de sélection des lignées et de production de reproducteurs parentaux avicoles". Reference 07-01 from the 01-02-2007 (38p) & its "Control notice". Code of practice Label-Rouge (INAO) – Tripartite agreement "SYNALAF-OC-SYSAAF"





# Poultry biodiversity in France : What are we talking about ?

**Local Breeds (pure):** Ornamental breeds not included,

- Local market,
- 47 Gallus, 63 Poultry breeds in total,

30 local poultry populations of 4 species taken in charge by SYSAAF in 2014.



Different strategies depending upon:

- Estimated risk of genetic losses,
- Depend upon population, size but also economic and social factors.

Ex situ vs. In situ



# Poultry biodiversity conservation strategies in France

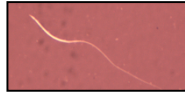
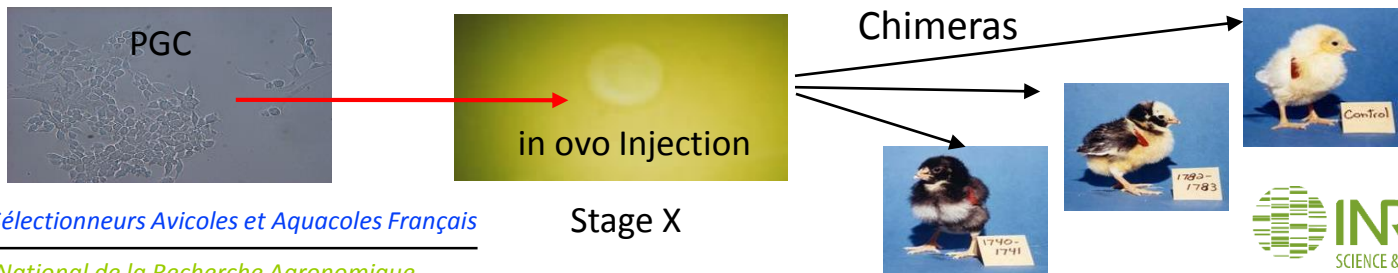
## Ex situ vs in situ based:

**Sperm cryopreservation: CRB-Anim program** - Biological resource centre network  
(French national poultry cryobanque)  
- *Local breeds, experimental lines & commercial pure lines.*

Poultry Species	Breeds - Lines	Males	Straws
Gallus (Ind. Sperm)	36	641	29148
Gallus (Coll.)	4	32 (2x4x4) + 4	500
<b>Total Gallus</b>	<b>40</b>	<b>677</b>	<b>29648</b>
Common duck (Ind.)	5	155	1031
Muscovy duck (Ind.)	9	325	1164
Geese (Coll.)	1	17 Families	367
Guinea fowl (Coll.)	1	4 x 12	805
<b>Nb species = 5</b>	<b>56</b>	<b>1208</b>	<b>33015</b>

## Biotechnology of reproduction: Research developments in process

- Sperm cryopreservation for turkey,
- IA for quails prior to sperm cryopreservation,
- Chimera production resulting from cryopreserved primordial germ cells.



# Poultry biodiversity conservation strategies in France

**BioDivA : BIODIVersity in Avian species - Local Endangered Breed Objective (CAS-DAR)**



# Poultry biodiversity conservation strategies in France

**ValBioDi** : Protective strategies to preserve endangered local poultry breeds.

- Pedigree population eliminated from the breeding site,
- Sperm cryopreservation,

- Settlement of a pedigree population in a breeding site,
- Sperm cryopreservation

- Pedigree population raised in a breeding site,
- Sperm cryopreservation,
- Implicating farmers.

- Very limited remaining population**
- Egg collection & incubation,
- Small population establishment,
- Sperm cryopreservation,
- Implication of new farmers.

- Pedigree population raised in a breeding site,
- Sperm cryopreservation,
- Implicating more farmers.

Géline de Touraine

Poule de Contres

Pintade Perle noire (Galor - Amboise)

Oie Blanche de Touraine

Dindon Noir de Sologne

Noire du Berry



BioDom Centre

**URLAF**  
Union des Races Locales Avicoles Françaises

**CRYOBANQUE NATIONALE**  
Groupement d'Intérêt Scientifique



# Poultry biodiversity conservation strategies in France

**BioDivA:** BIODIVERSity in Avian species - “Local Endangered Breed” Objective (CAS-DAR)

**ValBioDi:** Protective strategies to preserve endangered local poultry breeds.

**CRB-Anim:** Biological resource centre network.



## Common objectives of these research programs:

- Successfully set-up in situ and/or ex situ conservation programs of local poultry breeds in France.

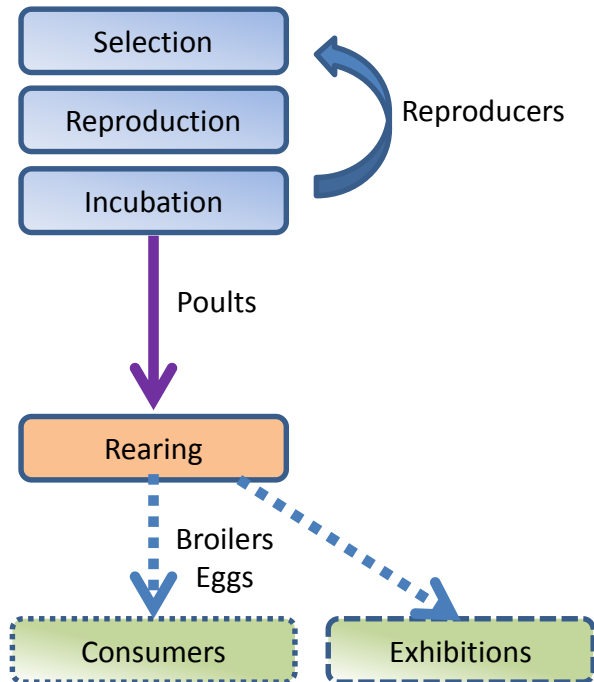
## Different strategies:

- *Characterisation of the breeding organisations for local breeds,*
- *Local breed phenotypic et genotypic characterisation,*
- *Setting in situ and/or ex situ conservation programs of local poultry breeds,*
  
- *How to access to financial supports for the local poultry endangered breeds, from the European Agricultural Fund for Rural Development (EAFRD) program within the Common Agricultural Policy (CAP) (2<sup>nd</sup> Pillar).*

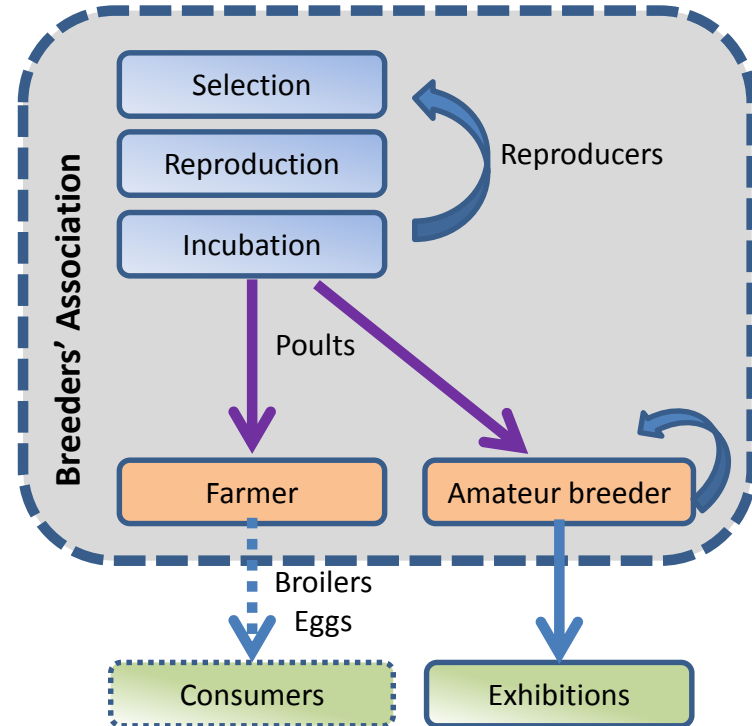
# Poultry biodiversity conservation strategies in France

## Characterisation of the breeding organisation

### Individual initiative



### Collective initiative (launching phase)

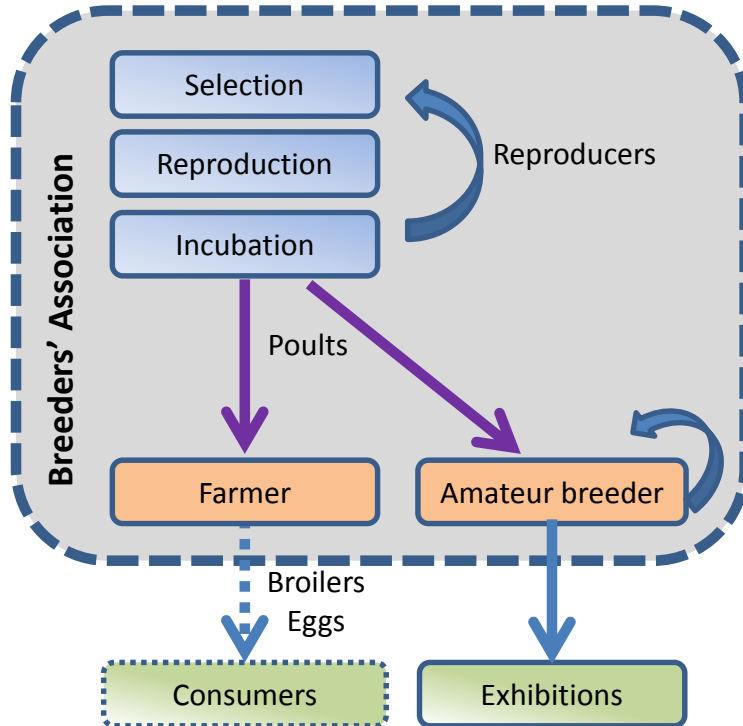


Local management by farmers (no pedigree)  
Limited markets and direct sells

# Poultry biodiversity conservation strategies in France

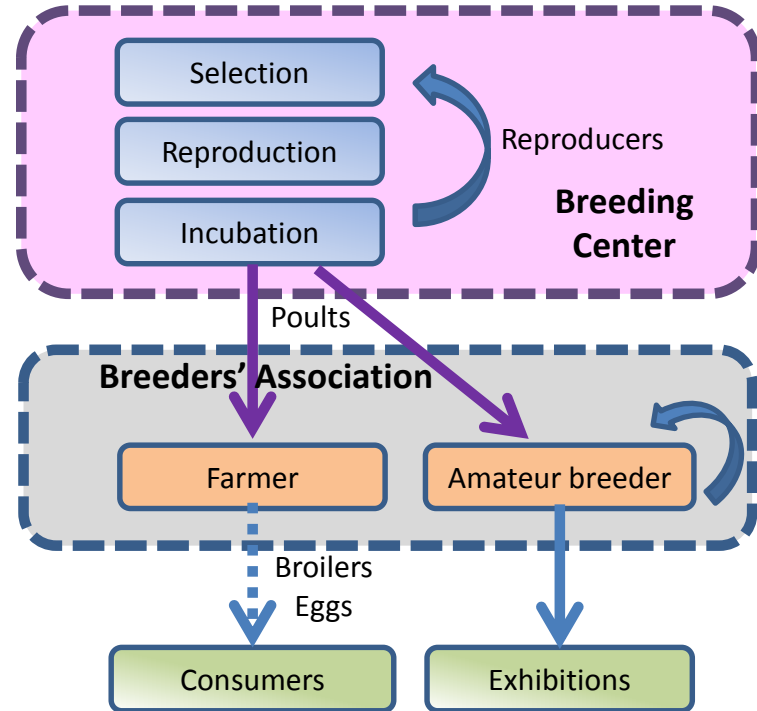
## Characterisation of the breeding organisation

### Collective initiative (launching stage)



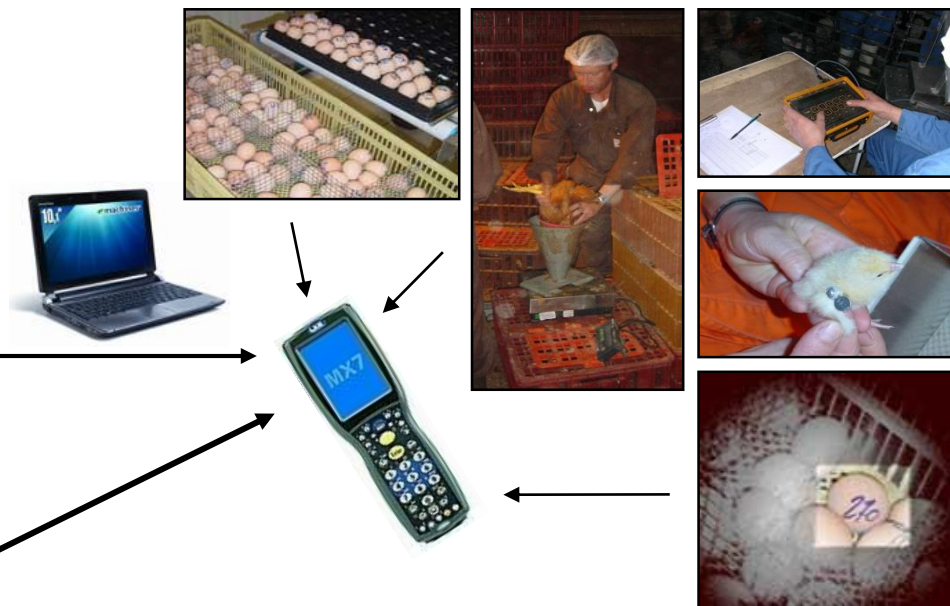
Local management by farmers  
(Semi-pedigree and/or park rotation)  
Limited markets and direct sells

### Collective initiative (Economic productive stage)



Centralized breeding flock management  
(Pedigree - Data collection "Herdbook")  
Larger markets and direct sells

# SYSAAF : Technical support for the implementation of dedicated genetic programs



## “Breeding sites”

- Rearing
- Pedigree reproduction
- Incubation & hatching
- Data collection
- Data transfer



**Central SYSAAF Database**  
(Data storage)



**SYSAAF**  
[Treatment chain]  
(Koala & OptivarPack)



Internet network



Internet or Local network



- Data treatment
- Breeder choices
- Mating scheme
- Genetic diversity



# Poultry biodiversity conservation strategies in France

Adhérent : CSVB | Lignée : ### | Cheptel : ### | Session : ### | Run : ###

Adhérent Environnement Lignée Session Run Options

Lignée >> Choix de la lignée

- **PARAOPTICHOIX.TXT**

Lignées

LIGNÉE	LIBELLE
ALS	POULE D'ALSACE
BB1	BOURBONNAISE pedi=D
BER1	POULE DU BERRY pedi=D
B11	Lignée Bresse male
B22	lignée Bresse Crete Pale (blanche,pattesbleues)
B55	Lignée Bresse femelle
B99	Lignée Bresse male emplumement rapide
CH	CHAROLAISE BLANCHE CRETE FRISEE pedi=D
CNF	COU-NU FOREZ Blanche,patblanches,Nana pedi=D
ESSB	ESSAI BRESSE 2010 B 51 - B 2951 - B 2915
FAV2	POULE FAVEROLLES LIGNEE DEUX
GASC	POULE DE GASCONNE (ARRIVEE W VRAC COUVÀ@S LE 26-3-10)
GAT	LA GATINAISE -pedi=D
GG3	GAULOISES GRISESMULT ISSUE DEPARENTSNESSGA-09D) pedi=D
GN	Lignée Bresse Gauloise Noire ex-BresseNoireBN
GNF	lignée gauloise noire issue du croisement GN*B55
GOU1	POULE DE GOURNAY(CLUB-SAUVERGARDE-RACES-AVICOLES-NORMANDES) pedi=D
GRAC	GELINE DE RACAN
HOU1	POULE DE HOUDAN pedi=D
MERL	MERLERAULT
VERC	POULE DU VERCORS

Cheptels

CHEPTEL	LIBELLE	DATE_CHEPTEL
14D	ISSUE DE 13D	29 SEPT. 2014
13D	ISSUE DE (12D ) BIODIVA	30 SEPT. 2013
12D	GENERATION 12B ISSUE 11B	01 OCT. 2012
11D	BERRY 11D ISSUES 10D	10 OCT. 2011
10D	POULE DU BERRY GENERATION 3 - 10D	14 OCT. 2010
09D-	POULE DU BERRY GENERATION 2 - 09D	06 OCT. 2009
08D	POULE DU BERRY 1ERE GENERATION	30 OCT. 2008

## SYSAAF - Database "Herd-Book" Line 1

Adhérent : CSVB | Lignée : ### | Cheptel : ### | Session : ### | Run : ###

Adhérent Environnement Lignée Session Run Options

Lignée >> Choix de la lignée

Lignées

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GRAC	GELINE DE RACAN
HOU1	POULE DE HOUDAN pedi=D
MERL	MERLERAULT
VERC	POULE DU VERCORS

Cheptels

CHEPTEL	LIBELLE	DATE_CHEPTEL
14B	ISSUE DE 13B	31 MARS 2014
13B	ISSUE DE 12B	08 AVR. 2013
12B	ISSUE DE 11B	11 AVR. 2012
11B	ISSUE DE 10B(110*440OPTIPQ) ECLOSION EN 15-2011	11 AVR. 2011
10B	10B ISSUE DE 09B 100*400	26 AVR. 2010
09B	100 * 400 MERES =GENERATION 09B NAISSANCE 09/17 LOT ECLOS 21-4-09	21 AVR. 2009
08B	GENERATION 08 B SEM 17/08	21 AVR. 2008
07B	GEN 07B issue de parents nes en 06B eclos le 26 avril 2007	26 AVR. 2007
06B	PEDIGREE B55 GENERATION 2006	26 AVR. 2006
05B	GENERATION 2005 SEM 18/2005	04 MAI 2005
04B	GENERATION 2004 705/2004	06 MAI 2004
03B	B55 GENERATION 2003 6 MAI 2003	07 MAI 2003
02B	GENERATION 2002 SEMAINE 17	22 AVR. 2002
01B	GENERATION 2001B	02 JUL. 2001
00A	generation2000A	27 JUN. 2000
99B	generation 99B	01 JUL. 1999
98B	1998-B	29 JUN. 1998
97B	1997-B	14 JUL. 1997
96-B	1996-b	17 JUN. 1996
95B	A PARTIR DES FICHIERS BASIC-HP - DATES APPROXIMATIVES	12 AVR. 1995
94B	A PARTIR DES FICHIERS BASIC-HP - DATES APPROXIMATIVES	14 AVR. 1994
93B	A PARTIR DES FICHIERS BASIC-HP - DATES APPROXIMATIVES	14 AVR. 1993
92B	A PARTIR DES FICHIERS BASIC-HP - DATES APPROXIMATIVES	08 AVR. 1992
91B	A PARTIR DES FICHIERS BASIC-HP - DATES APPROXIMATIVES	10 AVR. 1991
90B	A PARTIR DES FICHIERS BASIC-HP - DATES APPROXIMATIVES	11 AVR. 1990
BASE	INDIVIDUS DE BASE	10 AVR. 1989
15R	ISSUE DE 14R	

# Poultry biodiversity conservation strategies in France

## SYSAAF - Database = "Herd-Book" : One flock (Generation) of Line 1

### Registered characters

Adhérent : CSVB | Lignée : BER1 | Cheptel : 14D | Session : ### | Run : ###

Adhérent Environnement Lignée Session Run Options

Lignée >> Association Caractéristiques

Association caractères/caractéristiques Synthèse des associations

Caractéristiques disponibles

Cheptel : 13D - ISSUE DE (12D) BIODIVA

Chantier : Tous les chantiers

Pas de filtre

CHN	CAR	LIBELLE
1	1	SEXE
1	2	POIDS VIF A 56 JOURS
1	990	CHANTIER EFFECTUE EN COMPOSITI
20	1	1 D 2 MD 3 ND
71	10	ME1 : NB D'OEUFs MIS EN INCU
71	20	CLAIRS : NB D'OEUFs CLAIRS
71	21	M1 : NB D'OEUFs M1
71	30	BON : NB D'OEUFs BONS
71	31	M2 : NB D'OEUFs M2
71	40	ECLOS : NB D'ECLOS
71	50	BAGUES : NB DE BAGUES
71	997	LOT A ECLORE - NE PAS EFFACER
71	998	GENE A ECLORE - NE PAS EFFACER
71	999	LIGNEE A ECLORE - NE PAS EFFAC
80	10	OEUFs : NB D'OEUFs PESES
80	11	PDSTOT : POIDS TOTAL DES OEUFs
80	12	PDSMOY : POIDS MOYEN DES OEUFs
99	1	AGE AU PREMIER OEUF
99	2	L1 24/02/14 - 09/07/14 - 135J
1001	1	CAGESTEST-(MAJ JUILLET14)
1003	1	NW18S/MAXoeufENREGISTRE (% PON

Colonnes : 0,1,2,3 - Toutes les colonnes

Afficher toutes les colonnes

CODE	T	LIBELLE
RECOLTE1	0	1 er entrainement des coqs (1=D, 2MD 3ND)
CAGESTEST1	1	n° de cage test (1 ereponte) 1ere mise en cage.
CAGESTEST2	1	n° de cage test (1 ereponte) 2eme mise en cage.
NW18S	1	NW18S - (BRUT) pdt 18 1ere sem de ponte
PV8S	1	poids vif à 8 semaines
PW30S	1	poids moy Oeuf's 30 sem.d age
TXPONTE	1	NW18S/MAXoeufENREGISTRE (% PONTE!)

Caractéristiques associées

LI	CHP	CHN	CAR	LIBELLE	CRIT_1
BER1	13D	80	12	PDSMOY : POIDS MOYEN DES OEUFs	
BER1	12D	80	12	PDSMOY : POIDS MOYEN DES OEUFs	
BER1	11D	80	12	PDSMOY : POIDS MOYEN DES OEUFs	
BER1	10D	80	12	PDSMOY : POIDS MOYEN DES OEUFs	
BER1	09D-	1001	1	poids moy Oeuf's 30 sem.d age	

Ajouter >>

<< Enlever

# Poultry biodiversity conservation strategies in France

SYSAAF - Database = "Herd-Book" : Line 1

## Pedigree statistics

Adhérent : CSVB | Lignée : BER1 | Cheptel : 14D | Session : ### | Run : ###

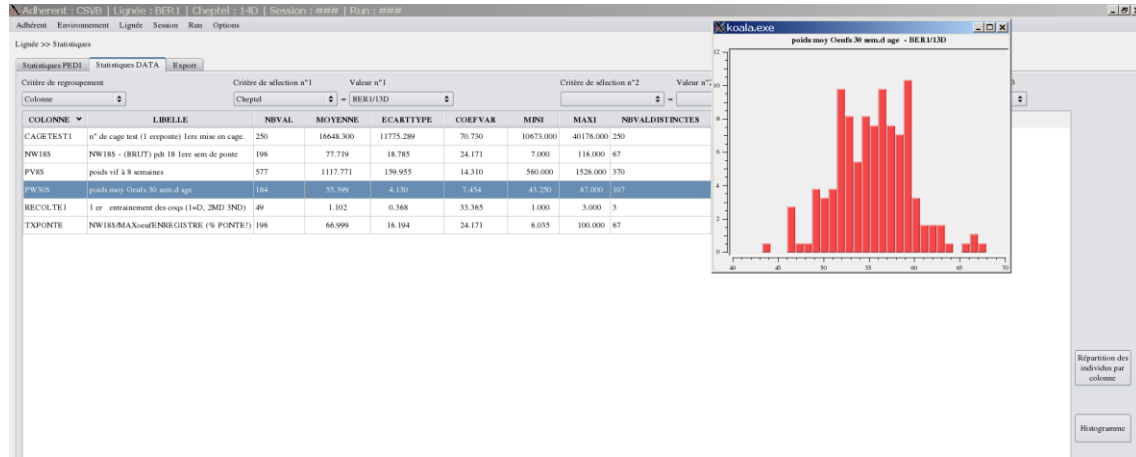
Adhérent Environnement Lignée Session Run Options

Lignée >> Statistiques

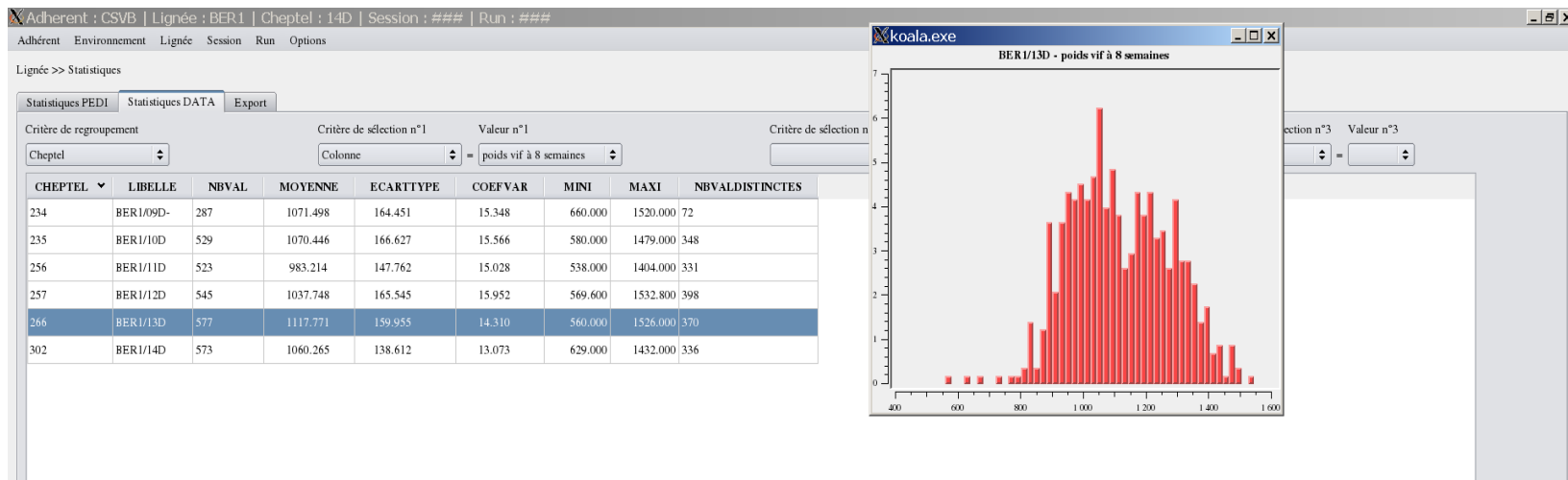
Statistiques PEDI | Statistiques DATA | Export

CHEPTEL	LI	CHP	MALES	FEMELLES	TOTAL	DATE_MOY_ECLUSION
302	BER1	14D	280	295	588	29/09/14 00:00
266	BER1	13D	301	277	601	30/09/13 00:00
257	BER1	12D	275	270	564	01/10/12 00:00
256	BER1	11D	210	313	549	10/10/11 00:00
235	BER1	10D	288	241	541	14/10/10 00:00
234	BER1	09D-	143	144	306	06/10/09 00:00
233	BER1	08D	92	70	259	30/10/08 00:00

## Data' statistics of one flock (generation)



## 'Data' statistics of all flocks



# Poultry biodiversity conservation strategies in France

## SYSAAF - Database = "Herd-Book" : Line 1

### Session of data treatment

Adhérent : CSVB | Lignée : BER1 | Cheptel : 14D | Session : 89 | Run : ###

Adhérent Environnement Lignée Session Run Options

Session >> Choisir

Sessions précédentes  Afficher les sessions expérimentales  Afficher les sessions terminées

CLE_SESSION	DATE_S	LIGNÉE	AUTEUR	EXP	TERM	COMMENTAIRES
89	27 NOV. 2014 - 10:38	BER1	BOULAY Maryse	non	non	BER1-14D-POUR CHOIX des JEUNES indexation de p8 (en 12d je viens de mettre le p10 en p8s calculeen p10/...
79	11 JUL. 2014 - 11:36	BER1	BOULAY Maryse	non	non	POUR CHOIX ET PEDI des 13D RP 14DJe vais utiliser le taux de ponte/maxpondu
44	28 NOV. 2013 - 11:05	BER1	BOULAY Maryse	non	non	1 er traitement - pedi complet de 2008-2013 mais je laisse 2008 car 1 ere generation et generation 13d pas mesu...
41	09 OCT. 2013 - 10:32	BER1	BOULAY Maryse	non	non	1 er traitement - pedi complet de 2008-2013 mais je laisse 2008 car 1 ere generation et generation 13d pas mesu...

Créer une nouvelle session

### Data treatment (h<sup>2</sup> Rg, VGs)

Adhérent : CSVB | Lignée : BER1 | Cheptel : 14D | Session : 89 | Run : 108

Adhérent Environnement Lignée Session Run Options

Run >> Voir/Modifier

Général Cheptels Peds Cheptels Data Colonnes du run Matrice d'effets appliqués

Libellé : VCE+BLUP POUR CHOIX des BER1-14D JEUNES Auteur : BOULAY Maryse

Date : 27 NOV. 2014 - 10:47 Logiciel : VCE BLUPHERVE Paramètres

Commentaires 295

j indexe le p8X (12d = le p10 est recalculé en règle de 3 pour faire le p8s) le pw et le txponte\_B en data je prends les 5 de session 14d 13d 12d 11d et 10d en pedi 2 de plus les 08d (base) et le 09d

Cheptels Run  Colonnes sélectionnées pour le run

LI	CHP	IMPORT	DATE_CHEPTEL	N_CL	CODE	LIBELLE	T	UTILISÉ
BER1	14D	oui	29 SEPT. 2014	1	PV8S_0	poids vif à 8 semaines	1	non
BER1	13D	oui	30 SEPT. 2013	2	PV8S_0_X	poids vif à 8 semaines	1	oui
BER1	12D	oui	01 OCT. 2012	3	PW30S_0	poids moy Oeufs 30 sem.d age	1	oui
BER1	11D	oui	10 OCT. 2011	4	TXPONTE_0	NW18S/MAXoeufENREGISTRE (% PONTE!)	1	non
BER1	10D	oui	14 OCT. 2010	5	TXPONTE_0_B	NW18S/MAXoeufENREGISTRE (% PONTE!)	1	oui
BER1	09D-	non	06 OCT. 2009	6	SEXE_0	EFFET ==> FIXE (du sexe !)	2	oui
BER1	08D - BASE	non	30 OCT. 2008	7	GENLOT_0	EFFET ==> FIXE (generation*lot)	2	oui
				8	ENVCOM_0	EFFET ==> REPETE (effet mere)	3	oui

# Poultry biodiversity conservation strategies in France

SYSAAF - Database = "Herd-Book" : Line 1

## Results:

cheptels

GENERATION # 1 BER1.09D  
 GENERATION # 2 BER1.10D  
 GENERATION # 3 BER1.11D  
 GENERATION # 4 BER1.12D  
 GENERATION # 5 BER1.13D  
 GENERATION # 6 BER1.14D

The more recent generation is the flock : BER1.14D

Pedi:								Data (normalises)							
2385	1468	1580	0	2	327704	5	BER1	13D	0.224	-0.233	0.529	2	4	334	2385
2386	1468	1580	0	0	327703	5	BER1	13D							
2387	1468	1580	0	2	327702	5	BER1	13D	0.742	0.555	-1.301	2	4	334	2387
2388	1468	1580	0	1	327701	5	BER1	13D	0.278	99	99	1	4	334	2388
2389	1456	1777	0	1	327168	5	BER1	13D	0.881	99	99	1	4	389	2389
2390	1543	1694	0	2	327282	5	BER1	13D	0.334	-0.649	-2.601	2	4	367	2390
3032	2114	2093	0	1	344690	6	BER1	14D	1.455	99	99	1	5	450	3032
3033	2062	2272	0	2	344635	6	BER1	14D	0.784	99	99	2	5	499	3033
3034	2016	1916	0	2	344570	6	BER1	14D	0.233	99	99	2	5	411	3034
3035	2010	2274	0	2	344609	6	BER1	14D	0.53	99	99	2	5	500	3035
3036	2078	2387	0	1	344455	6	BER1	14D	0.383	99	99	1	5	533	3036
3037	1907	2400	0	1	344452	6	BER1	14D	1.53	99	99	1	5	416	3037

## Genetic parameters

HERITABILITIES & GENETIQUES CORRELATIONS:

PV8S\_X PW30S TXPONT\_B  
 0.681 0.607 -0.315  
 0.607 0.775 -0.371  
 -0.315 -0.371 0.499

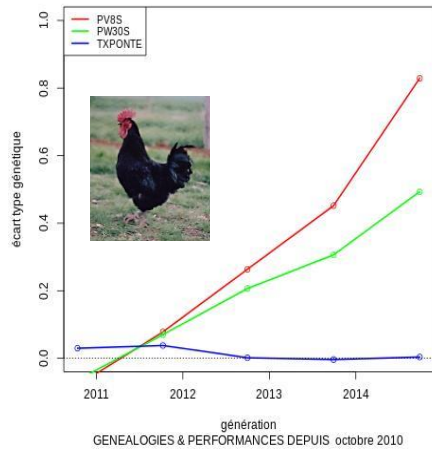
## Individual genetic values

2385	327704	320461	320601	2	5	0.430011	0.151716	0.452191
2386	327703	320461	320601	0	5	0.529764	0.436895	0.141807
2387	327702	320461	320601	2	5	0.785461	0.806950	-0.503902
2388	327701	320461	320601	1	5	0.057024	0.149829	0.290505
2389	327168	320441	320805	1	5	0.432575	0.020623	0.347190
2390	327282	320536	320723	2	5	0.547868	0.131385	-1.115024
3032	344690	327267	327225	1	6	1.558315	0.621323	-0.394511
3033	344635	327721	327452	2	6	1.597199	1.251620	-0.066997
3034	344570	327449	327177	2	6	1.382719	0.983487	-0.211802
3035	344609	327413	327450	2	6	1.445060	0.680432	-0.329612
3036	344455	327190	327702	1	6	0.740070	0.692438	-0.304459
3037	344452	327159	327256	1	6	1.738041	1.660169	-0.958579

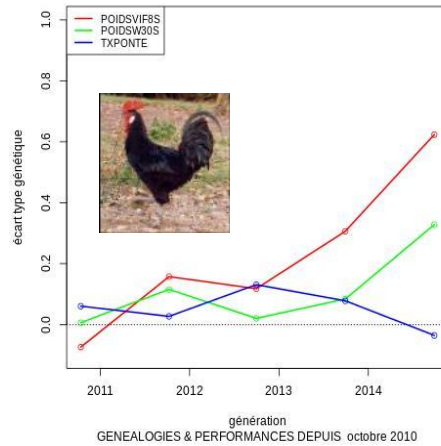
# Poultry biodiversity conservation strategies in France

## Genetic value evolution 2015

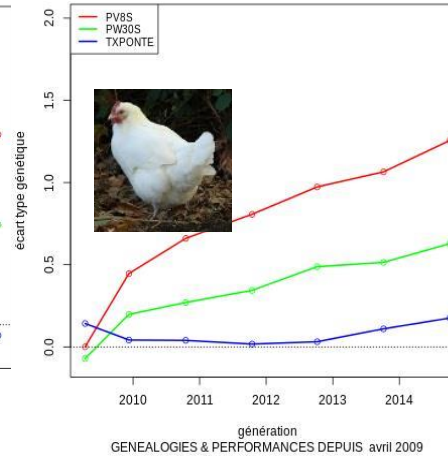
EVOLUTION GENETIQUE BER1



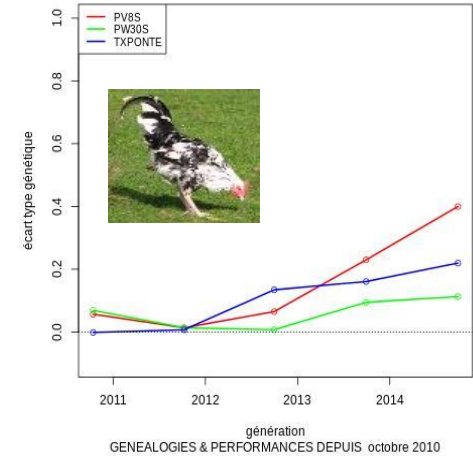
EVOLUTION GENETIQUE BAR1



EVOLUTION GENETIQUE GAT

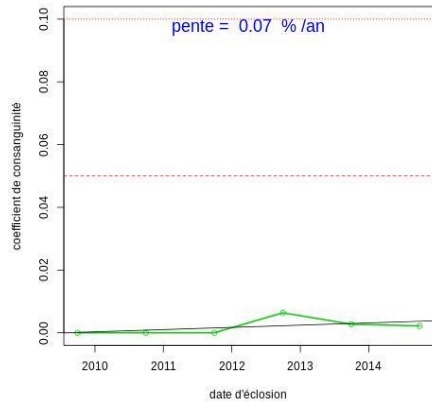


EVOLUTION GENETIQUE GOU1

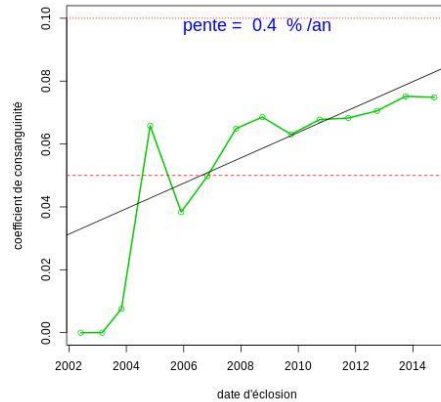


## Consanguinity evolution

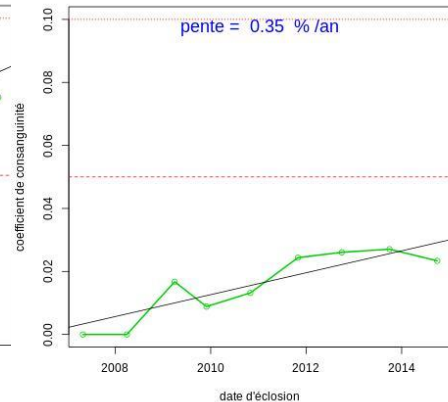
Evolution de la consanguinité moyenne BER1



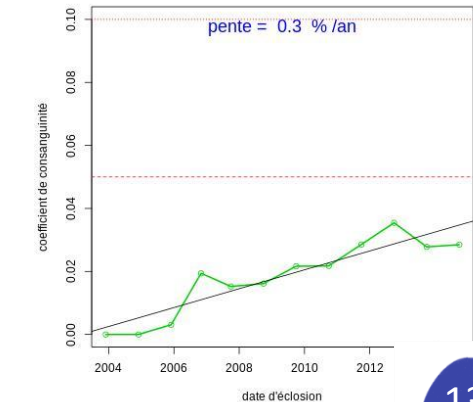
Evolution de la consanguinité moyenne BAR1



Evolution de la consanguinité moyenne GAT

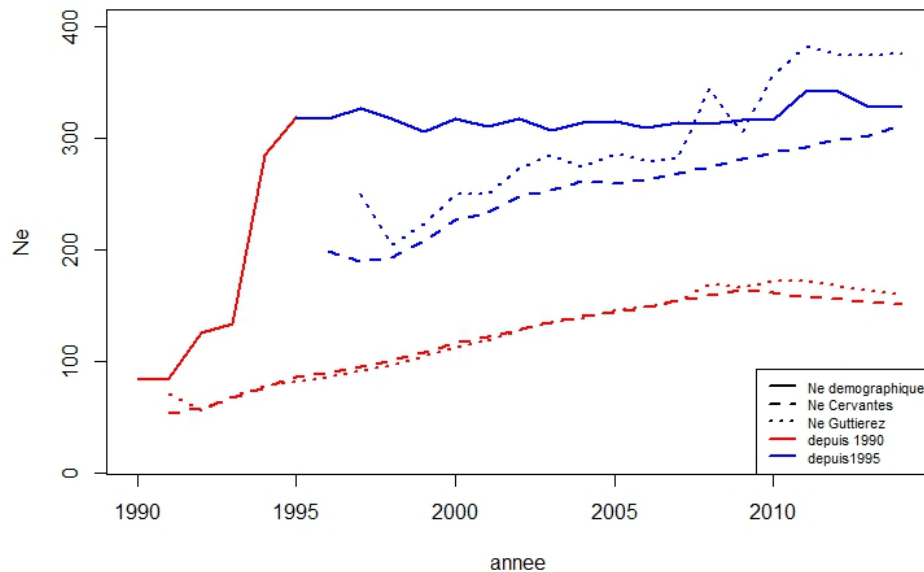


Evolution de la consanguinité moyenne GOU1



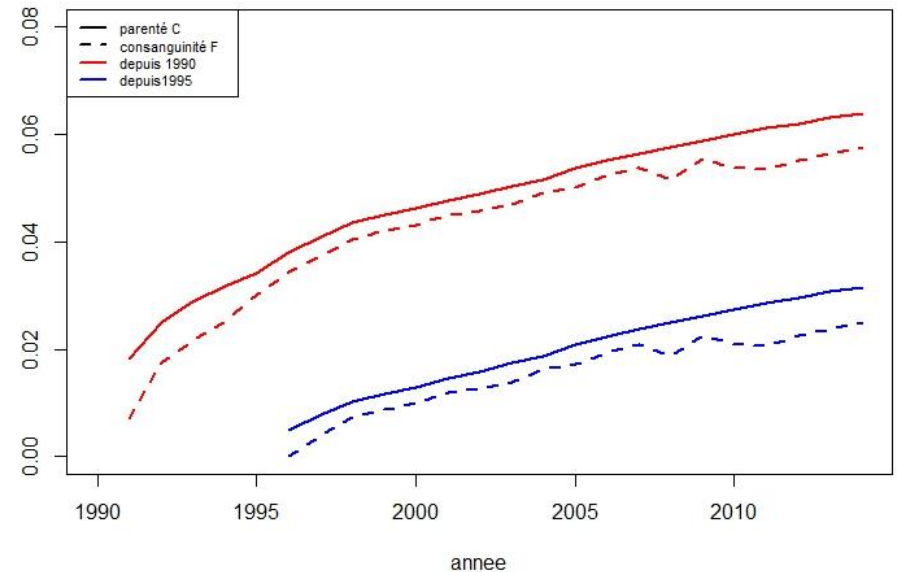
# Poultry biodiversity conservation strategies in France

## Evolution du Ne selon le mode de calcul et la population d'origine



Effective population size depending on pedigree knowledge

## Evolution consanguinité/parenté selon la population d'origine

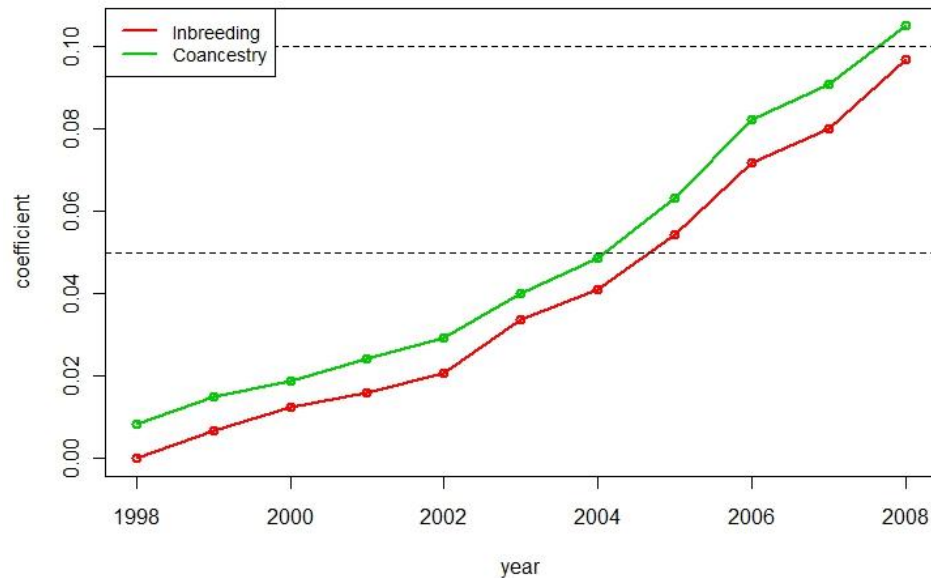


Consanguinity level vs Rate of increase  
What's matter more?

# Poultry biodiversity conservation strategies in France

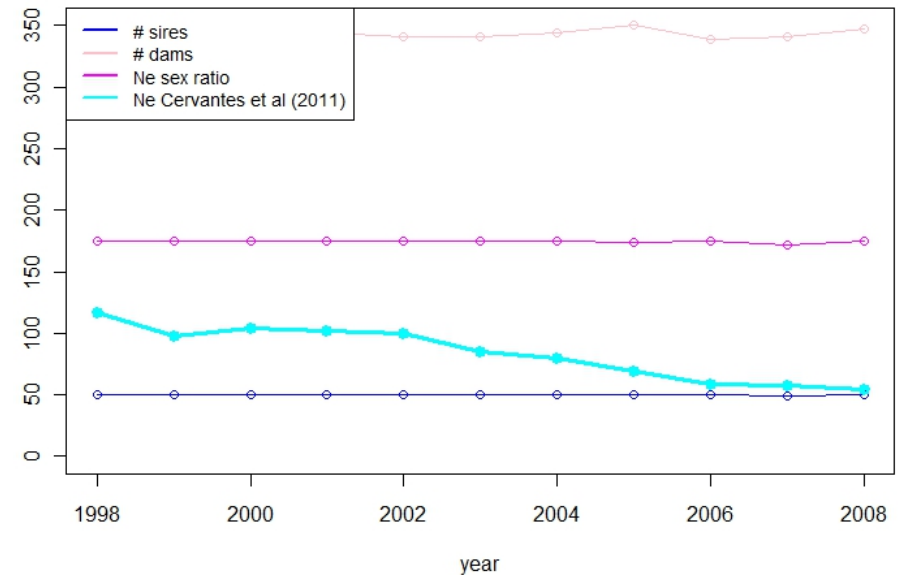
Selected populations can be endangered through careless management...

### Coancestry & Inbreeding



The inbreeding rate is 1% per year.

### Population size

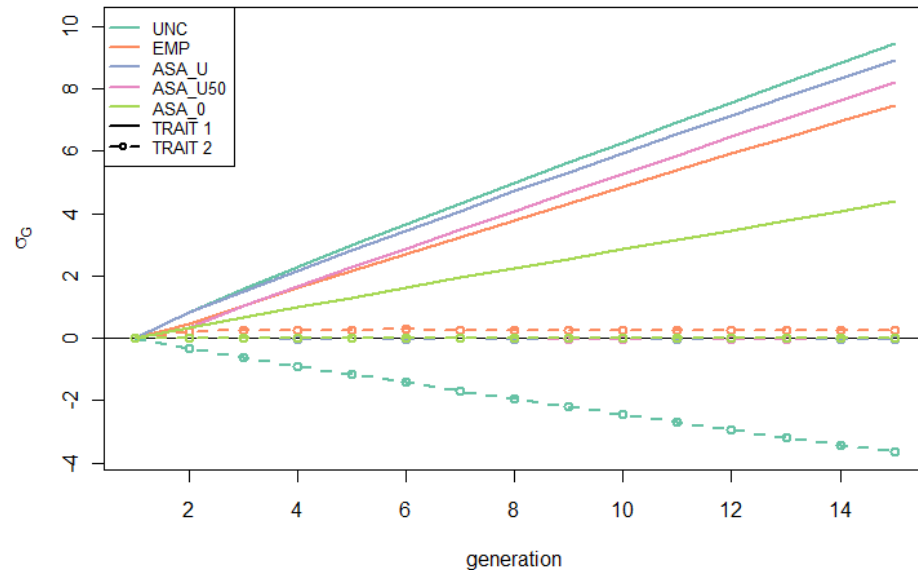


The effective population size decreases.



# Poultry biodiversity conservation strategies in France

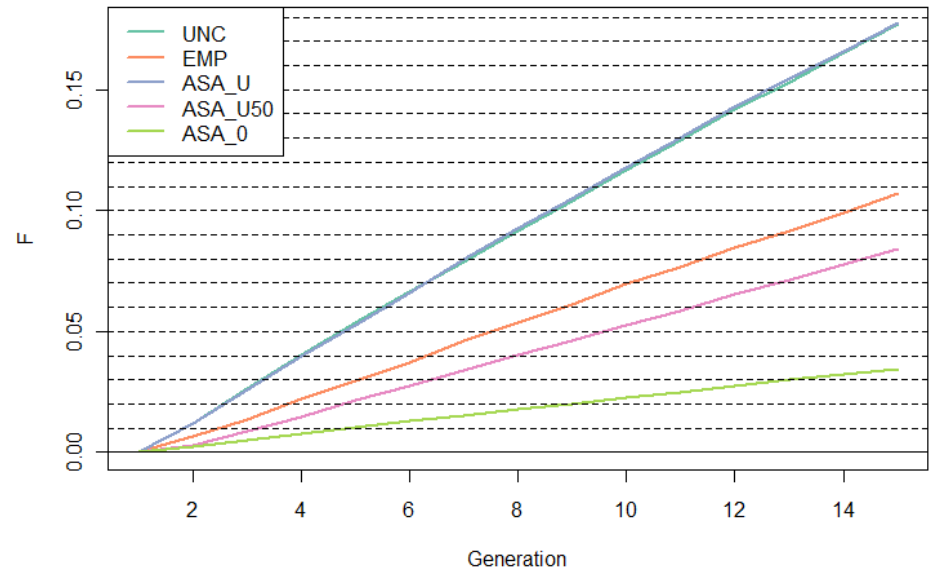
PREDICTED GAIN ACROSS GENERATIONS



Some gain can be achieved, even with a conservative management of the coancestry.

Some characters being antagonist (*e.g.* reproduction vs. growth)

INBREEDING COEFFICIENT

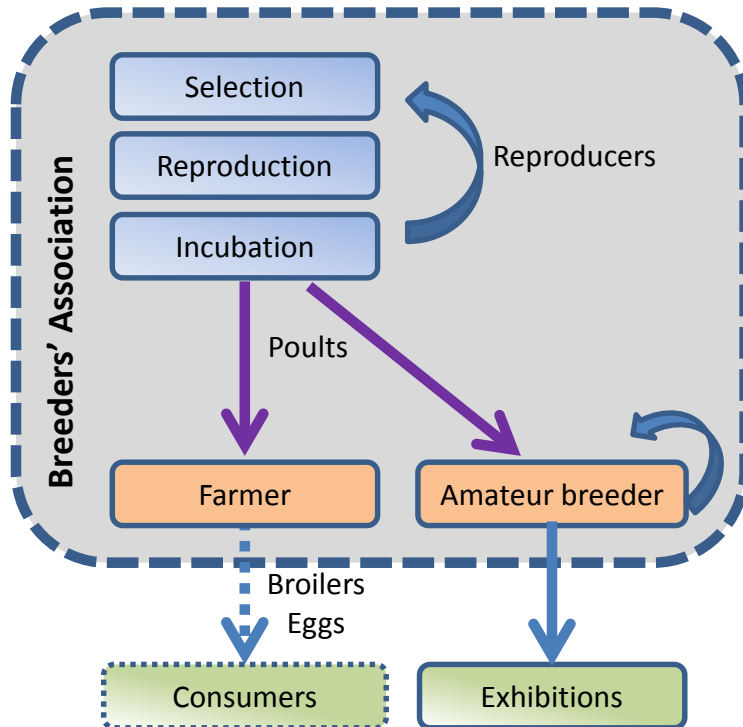


As far as inbreeding is concerned, ASA\_U50 outperforms EMP as well.

# Poultry biodiversity conservation strategies in France

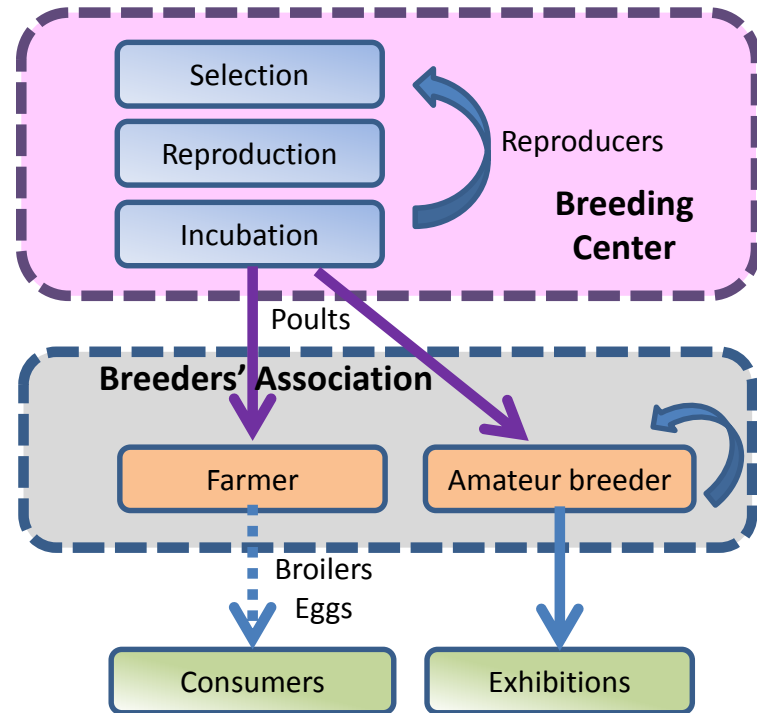
## Characterisation of the breeding organisation

### Collective initiative (launching stage)



Local management by farmers  
(Semi-pedigree and/or park rotation)  
Limited markets and direct sells

### Collective initiative (Economic productive stage)



Centralized breeding flock management  
(Pedigree - Data collection "Herdbook")  
Larger markets and direct sells

The [2013 reform](#) leaves in place many of the key features of rural development policy from 2007-2013 known as the “second pillar” of the Common Agricultural Policy (CAP), such as a **Financial support for the local endangered breeds.**

In particular, as in the past, the policy will be implemented through **national and/or regional rural development programs (RDPs)** so called

**European Agricultural Fund for Rural Development (EAFRD) instrument,** established by Regulation (EC) [1290/2005](#)).

## Criteria for 2014-2020:

- A list of eligible local breeds at risk of being lost for agriculture should be established and notified to the EC,
- The number of breeding females for a specific breed should be known,
  - ✓ **These two criteria have to be attested for by a recognized scientific body.**
- ✓ **A recognized technical organism should register and keep up-to-date a herd-book.**
- ✓ **This recognized technical organism should provide proof that it has the necessary competences and knowledge to identifying the animals from the endangered breeds.**

**Definition:** “local breed” was in the sense of the French regulation (*Code Rural*, Article D-653-9): “a breed mainly linked to a specific territory by its origins, its location or its use”; “territory” meaning an area much smaller than the whole country.

## A multi-indicator approach:

- 1 - Identification of the various causes of threat of abandonment,
- 2 - For each cause, define one or more indicators :
  - That make sense in the context,
  - Few and easy to inform,
  - Not susceptible to generate pernicious effects,
- 3 - In order to combine these indicators of different nature, the observed values were converted into scores on a scale of **0 (no threat) to 5 (maximum threat)**, the way to convert depending on the indicator.

This method was applied on 178 French local breeds, from 10 different species: cattle, sheep, goats, pig, horses, donkeys, chicken, turkey, goose and common duck.

Gallus	Guinea fowl	Turkey	Geese	Common duck	Mucovy duck
47	0	3	9	4	0

*(Verrier E. and RAMAGE consortium members, 2015)*

## The 6 indicators used to assess the degree of endangerment of a local breed:

- 1 - the current number of breeding females,
- 2 - the evolution of the number of breeding females during the last 5 years or generations, according to the species,
- 3 - the proportion of crossbreeding (Not appropriate for poultry species),
- 4 - the effective population size,
- 5 - the organization of breeders and the technical support,
- 6 - the socio-economic context.

- **Indicator 1** is the **Main indicator** : Note 1 to 5.

- **Indicators 2 to 6** are **Modulatory or secondary indicators** - The breed is considered as **weakened** if :

- mean of the 5 notes  $> 2.5$  or at least 2 notes  $\geq 4$

If so, the thresholds were increase of 20%.

## Rural development policy for the period 2007-2013 (2014) within the Common Agricultural Policy (CAP)

- Financial support for the local endangered breeds through the **European Agricultural Fund for Rural Development (EAFRD) instrument**, established by Regulation (EC) [1290/2005](#).

L 368/58

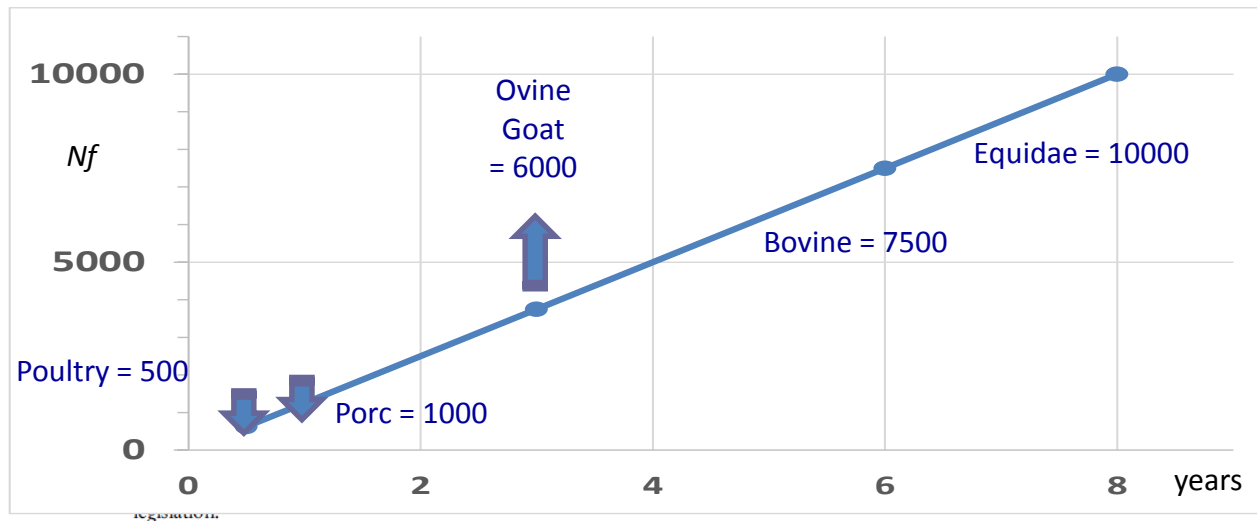
EN

Official Journal of the European Union

23.12.2006

### ANNEX IV

#### THRESHOLDS FOR ENDANGERED BREEDS (REFERRED TO IN ARTICLE 27(4))



Logic = Rate of increase  
of the consanguinity

Demographic logic = The  
weaker is the capacity of  
demographic boost, the  
higher is the threshold  
of eligibility

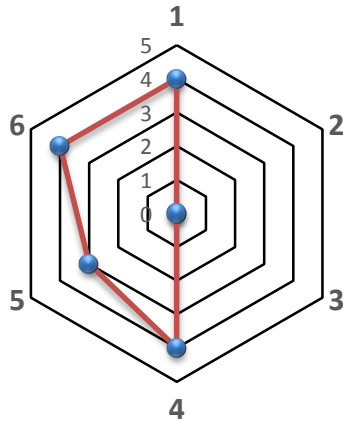
Poultry = 500

ans

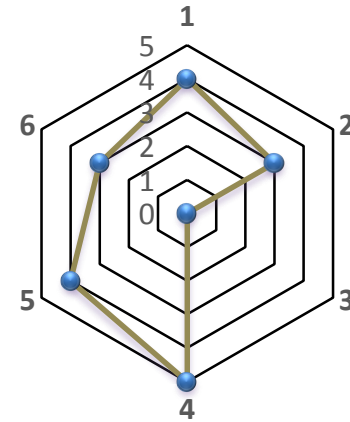
COMMISSION REGULATION (EC) No 1974/2006 of 15 December 2006

# A multi-indicator approach to assess the degree of endangerment of a local breed

Noir du Berry (N = 2.2)



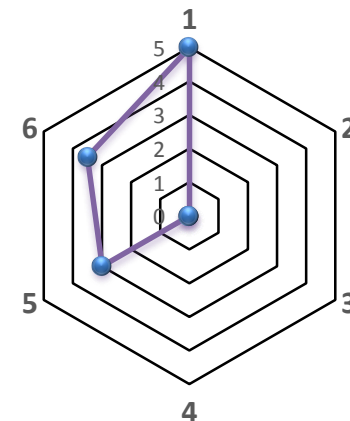
Poule de Barbezieux (N = 3)



## Indicators:

- 1 - Number of breeding females,
- 2 - Evolution of Nf (5 generations),
- 3 - Proportion of crossbreeding (Not appropriate),
- 4 - Effective population size,
- 5 - Organization and technical support,
- 6 - Socio-economic context.

Poule de Marans (N = 1.3)



## Financial support for the local endangered breeds.

To be implemented through **national and/or regional rural development programs (RDPs)** so called **European Agricultural Fund for Rural Development (EAFRD) instrument**, established by Regulation (EC) [1290/2005](#)).

### Not adequate for poultry species:

- To be paid to the farmers
- Limited amounts per bird (0.03 L.U./hen & 0.014 / others poultry)
- Important additional cost for pedigree.

### Activation of the delegated acts: (Proposal submitted to the commission)

- To be paid to the breeders' association,
- Fixed amount of money per breed (Corresponding to estimated additional cost),
- Commitments :
  - Commercialisation,
  - Pedigree knowledge (Herd-book),
  - Minimum number of males (20), females (100) and offspring (500) per generation,



# Acknowledgment

# Poultry biodiversity preservation strategies in France



Grazie per la vostra attenzione

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*Institut National de la Recherche Agronomique*