Estimation of economical impact of chromosomes translocation on pig production

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Index

- Chromosomal rearrangements.
- Reciprocal translocations.
- Detection.
- Estimation of Economical Impact.
- Conclusions

Chromosomal rearrangements

Chromosomal rearrangements

Classification:

Numeric abnormalities:

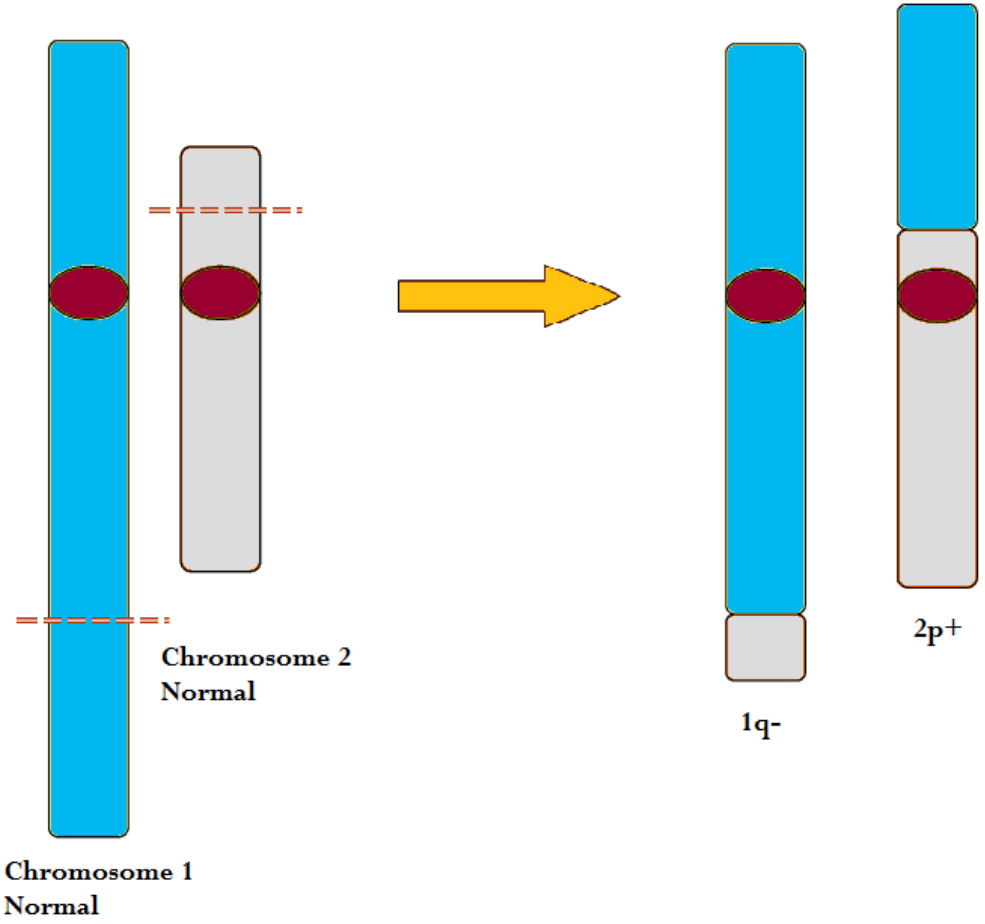
Structural abnormalities:

- Deletions
- Duplicities
- Inversions
- Translocations
  - Robertsonian Translocations
  - Reciprocal Translocations

Reciprocal Translocations. Characteristics

- Interchange of chromosomal segments
- Balanced abnormality, with no looses of genetic material.
- No phenotype alternations.
- Increase the risk of appearance of unbalanced gametes.
- Generates reproductive problems.
- No alternations in ejaculates quality.

Reciprocal Translocations.



Reciprocal Translocations.

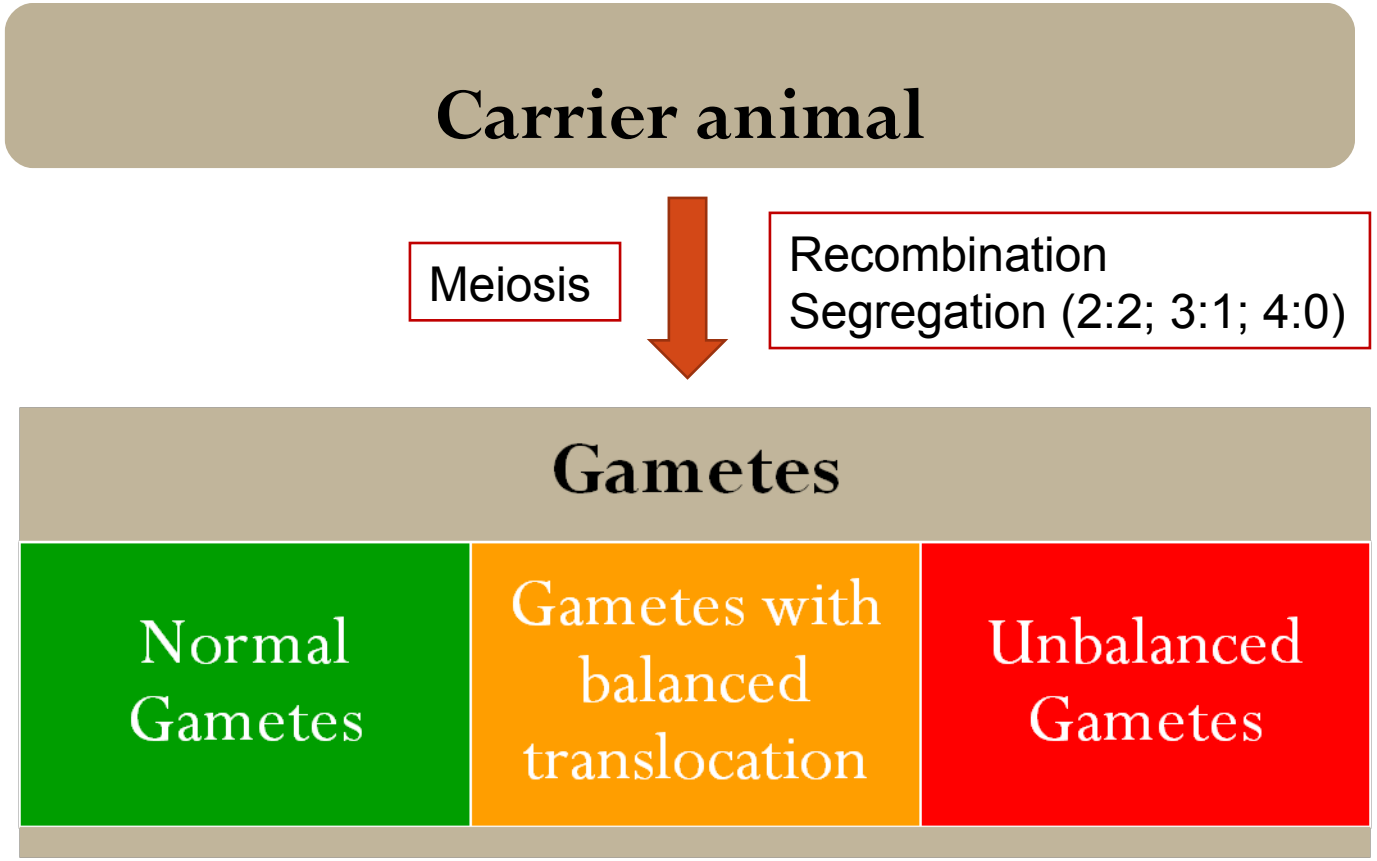
Influence on:

- Gametogenesis

- Embryos mortality: prolificity and fertility.

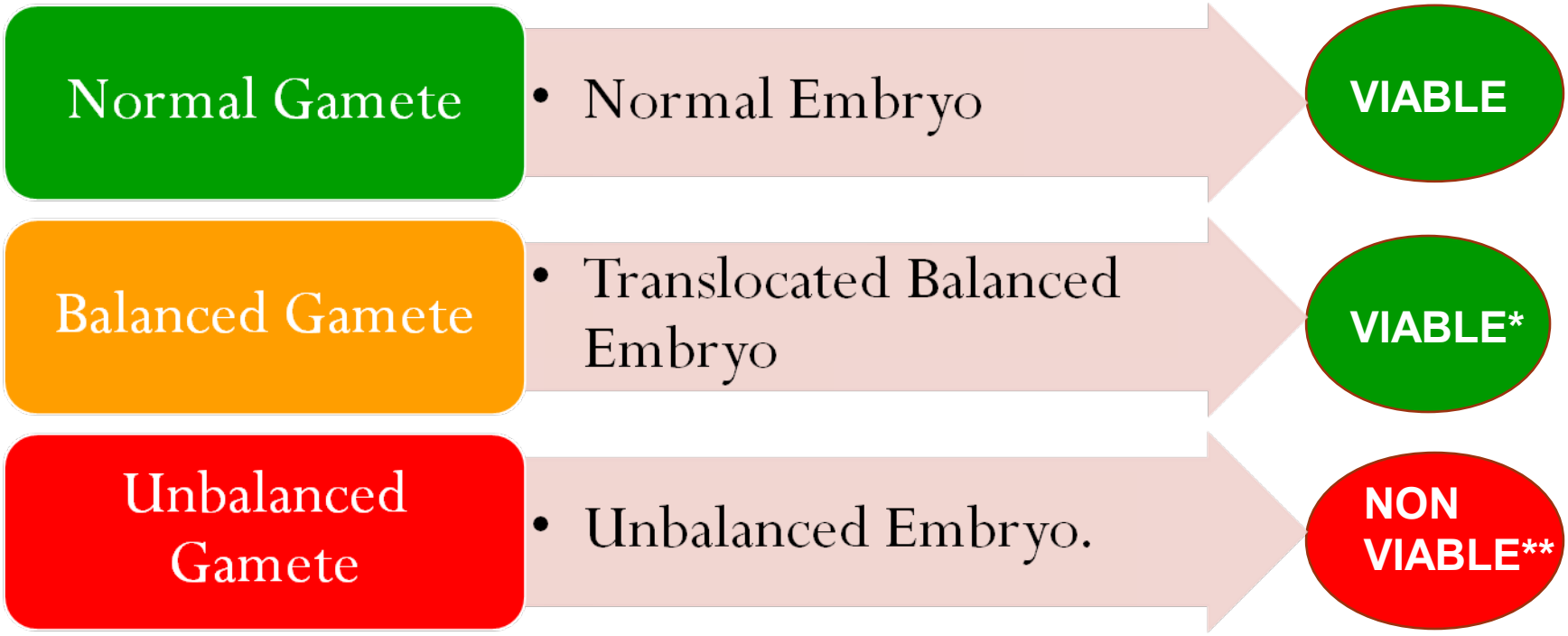
Reciprocal Translocations

Gametogenesis.



Reciprocal Translocations

Embrions mortality: Prolificity and Fertility



* Viable but carrier of translocations

** Non viable or deformed

Reciprocal Translocations

Unbalanced Embriones:

- Uncorrect implantation
- Embrion deformity
- Embrion degeneration

→ EMBRIONARY DEATH

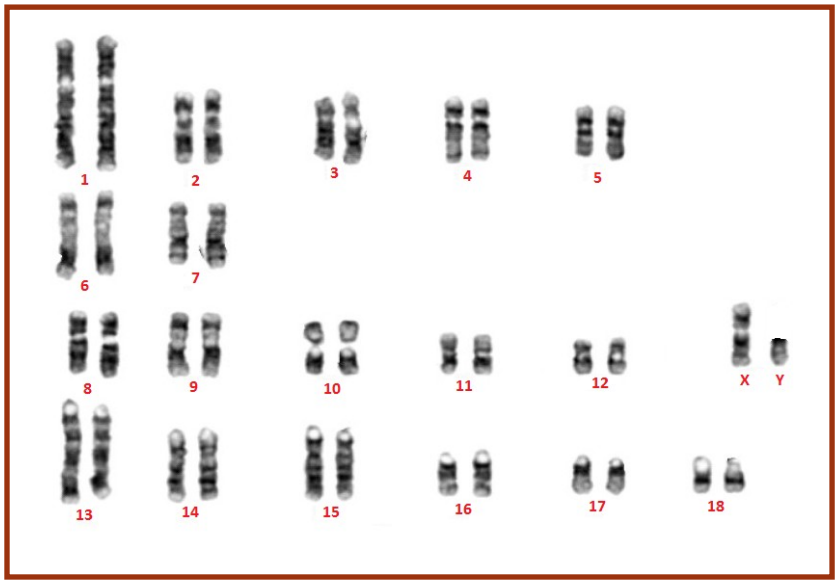
Embrionary death → ↓ Litter size → PROLIFICITY ALTERNATION

Pigs: < 4 Viable embryos → Return estrus → FERTILITY ALTERNATION

Detection

Karyotype Analysis

Metaphase

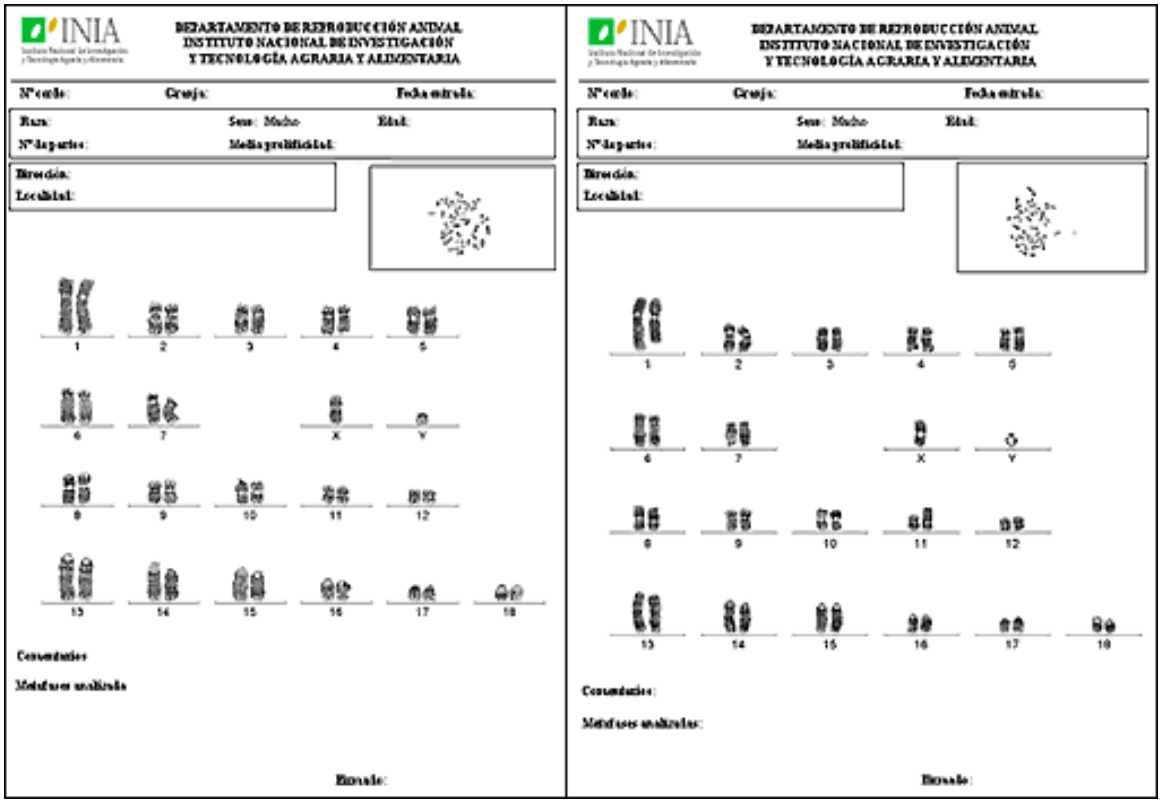


Clasification

Detection

Normal Karyotype

RT 1q- ; 11p+



Karyotype Analysis perform by INIA - Department of Animal Reproduction

Estimation of Economical Impact

Estimation of Economical Impact

HIPOTESIS	
Prolificity descreas	- 20 %
Normal Fertility	85 %
RT Fertility	80 %
Doses / A.I	2,5
Litter	50 % boars ; 50 gilts
% Selection of boars	30 %
Terminal Boar Price	1.000,00 €
Piglet Price	35, 00 €

Estimation of Economical Impact:

DAM LINE: GP FEMALE

Non significant impact. There is no selection of animals with low prolificity. BLUP, EBV System

DAM LINE: GP MALE

Non significant impact. There is no selection of animals with low prolificty. BLUP, EBV System.

Estimation of Economical Impact

Estimation of Economical Impact: SIRE LINE: GP Sow_

	GP Normal	GP rt
Piglets / productive life	60	48
Boars / productive life	30	24
Selected boars / prod. life	9	7
€ (1000 € / boar)	9.000	7.000
Diference		**- 2.000**

Estimation of Economical Impact

Estimation of Economical Impact: SIRE LINE: GP Boar

	GP Normal	GP rt
Doses/ Year	1.500	1.500
# A.I.	600	600
Farrowings	510	480
Piglets	5.100	3.840
Boars	2.550	1.920
Selected Boars	765	594
€	765.000	594.000
Difference		**- 171.000***

Estimation of Economical Impact: Terminal Boar_

	Terminal Boar	T. Boar RT
Doses / Year	1.750	1.750
# A.I.	700	700
Farrowings	595	525
Piglets	5.950	3.150
€	208.250	110.250
Difference		**- 98.000**

Conclusions

Conclusions

Presense of carrier animals with reciprocal translocations is low: 0,5 – 1 % of population

Presence of animal with RT causes a decrease of prolificacy 40% average (5 – 100 %)

Detection is carried out by Karyotype Analysis.

Lack of detection on time may cause important economical looses.

Routine practices like elimination of hypo-productive animals and the application of heterospermic insemination, reduce negative effects of possible presence of carrier RT animals.