Possibilities and Concerns
Perspectives of Farm Animal Breeders

Sevilla

10 June 2005

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Svensk Avel

Chair European Forum of Farm Animal Breeders

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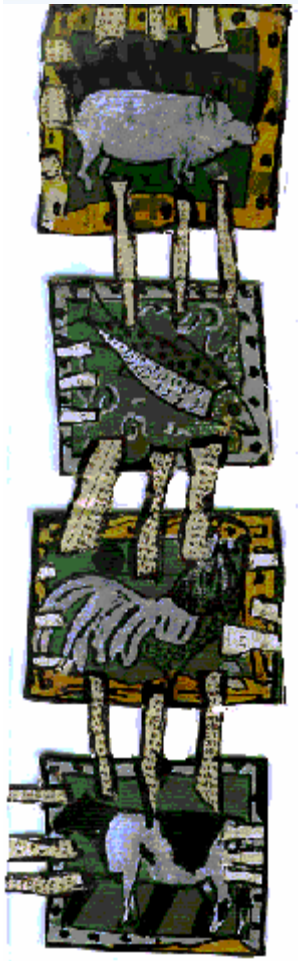
EFFAB



Membership

BE: Gentec, CZ: Czech Fleckvieh, DK: Danish Cattle, Danbred, ES: ANPS, EST: Estonian Pig Breeders, FIN: FABA, FR: France Hybrides, Hubbard, ISA, SYSAAF, UNCEIA, GE: ADR, Lohmann, ZDS, IRL: Irish Cattle Breeders, IT: ANAS, Semenitaly, NL: Altapon, CRV/HG, HPB, IPG, Intervet, Nutreco, NO: AFGC, AquaGen, Team Semin, POL: WCMIRZ, SW: Svensk Avel, UK: Aviagen, British Poultry, BUT, Genesis Faraday, MLC, Sygen/PIC

All: 1 Representative, 1 Voice

Fee: 1818 €

East European organisations 2 year free

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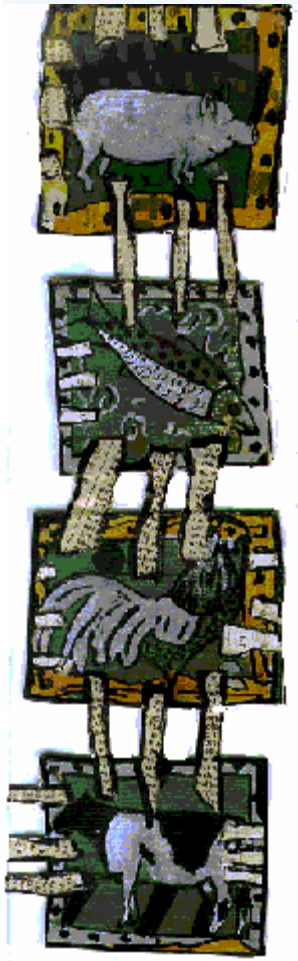
Svensk Avel is the major cattle breeding company in Sweden



Svensk Avel is jointly owned by Swedish Dairy farmers, through their local livestock associations

- Number of domestic inseminations 602 000
- Units from Svensk Avel used in Sweden 515 000
- Exported units 350 000

- Annual progeny testing 90 SRB bulls
  70 Holstein
- Number of full-time employees 47

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Who are farm animal breeders?

Breeders are persons / organisations with the aim to **improve genetic make-up** of farm animals (cattle, pigs, poultry, fish)

Their **customers** are:

Farmers **producing food** of animal origin

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Which are their responsibilities?

1) Definition of breeding goals

2) Recording and identification of animal with desirable traits

3) Utilization of selected animals for reproduction

4) Evaluation of the obtained response

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Farm animal breeding
Organisation

- **Breeding on herd level** (cattle, goats, sheep, pigs)

  Phenotype (+ breeding values)
- **Regional and national breeding programmes** (SME, cattle, pigs)
- **International companies/organisations:** working with global programmes (SME or small units in multinational; pigs, broilers, layers, turkeys, ducks, farmed fish)

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Possibilities 1

SELECTION

- **Clone superior sires to** increase semen production

REPRODUCTION

- **Higher genetic level of replacement heifers/gilts** Production animals. Generation interval shorter (11-12 months in cattle) with cloning
- **Multiplication of breeding animals** e.g. beef bulls for herds for natural service

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Possibilities 2

BIODIVERSITY

- **Utilisation for genetic diversity** (preservation rare breeds, as one of the existing reproduction techniques)

TRANSGENICS

- **A prerequisite for the use of transgenics** improved products (costs, acceptability)

NEW TECHNOLOGY...

- **Novelty,** marketing issue

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Concerns

Technology

- Welfare and health of animals
- Efficiency
- Reliability

Acceptance

- Ethics
- Public reaction

Biodiversity

- Risk for inbreeding

Price

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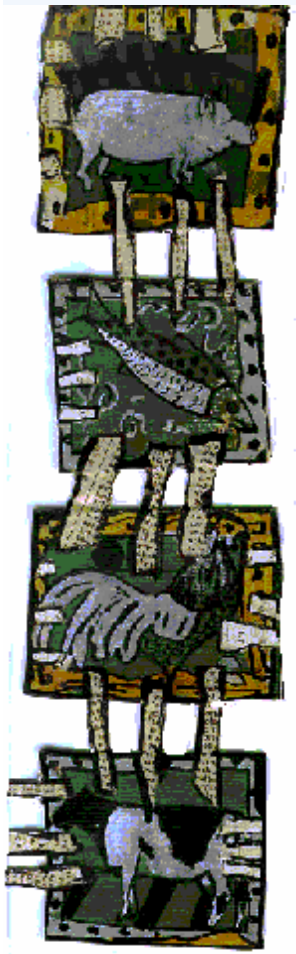
EFFAB (FAIP) position paper on animal cloning 2003



Major observations:

Technical obstacles

1a. Health problems (“cloning syndrome”)

1b. Identity of clones not sure

Legal obstacles

2. No legal framework non-transgenic animal cloning at European and national levels

Societal/ethical obstacles

3. New technology not accepted by society

Economic obstacles

4. Not cost effective

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EFFAB (FAIP) position paper on animal cloning 2003

-Call for enhanced transparent European research in non-transgenic farm animal cloning.

- Call for an ethical discussion and dialogue between citizens, society organisations and stakeholders

- Call for a legal European framework with regard to animal cloning

European breeding organizations are not interested in the use of cloned animals for commercial purposes at current state of the art of the technology.

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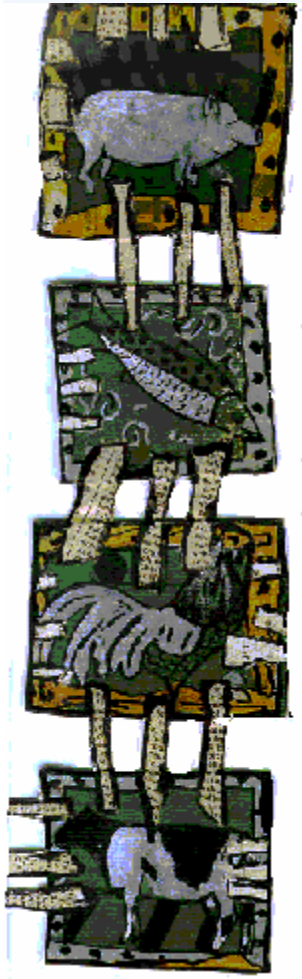
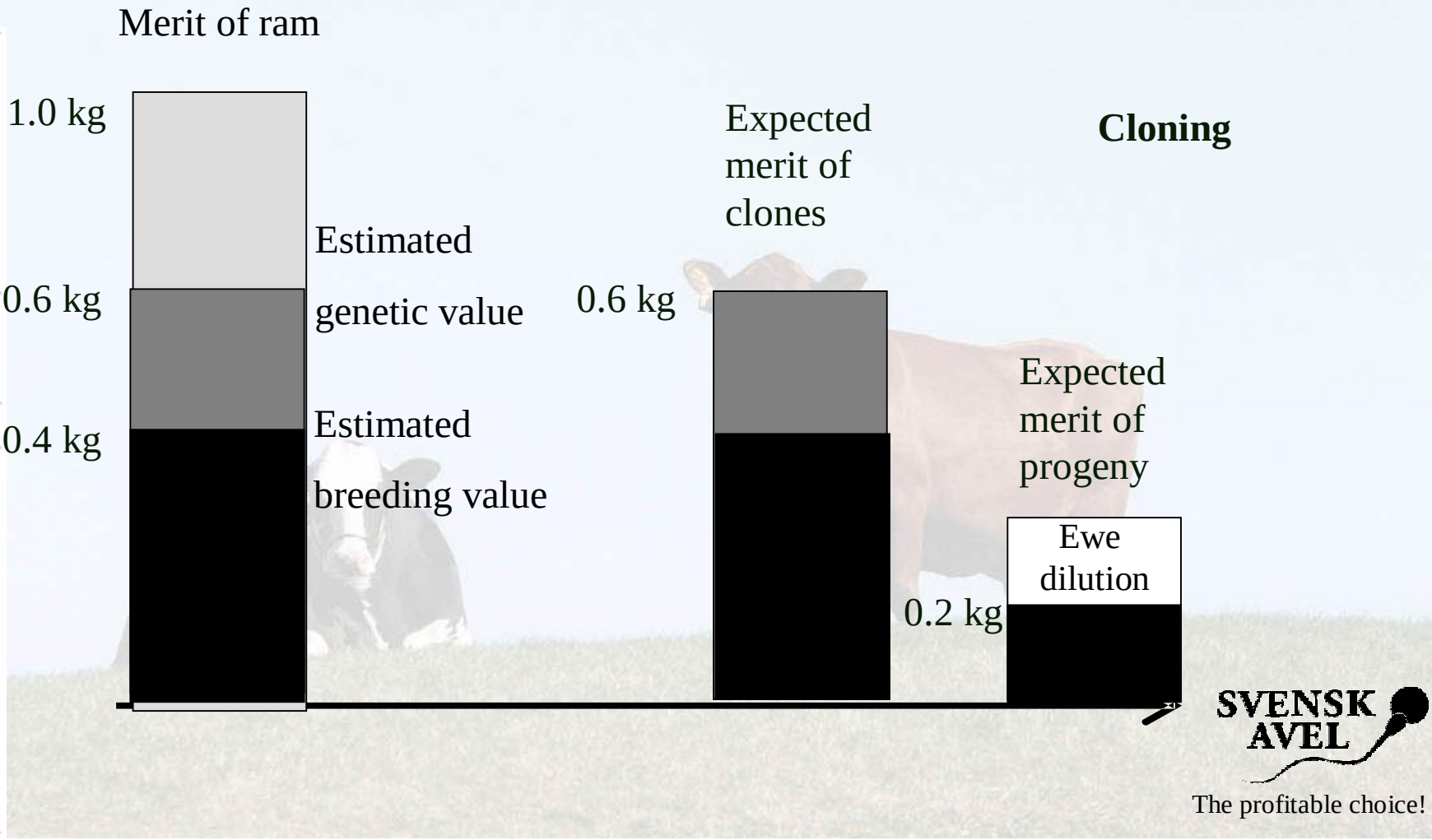
Example
Merit of clones and progeny
from a ram with 1 kg superiority in fleece quality





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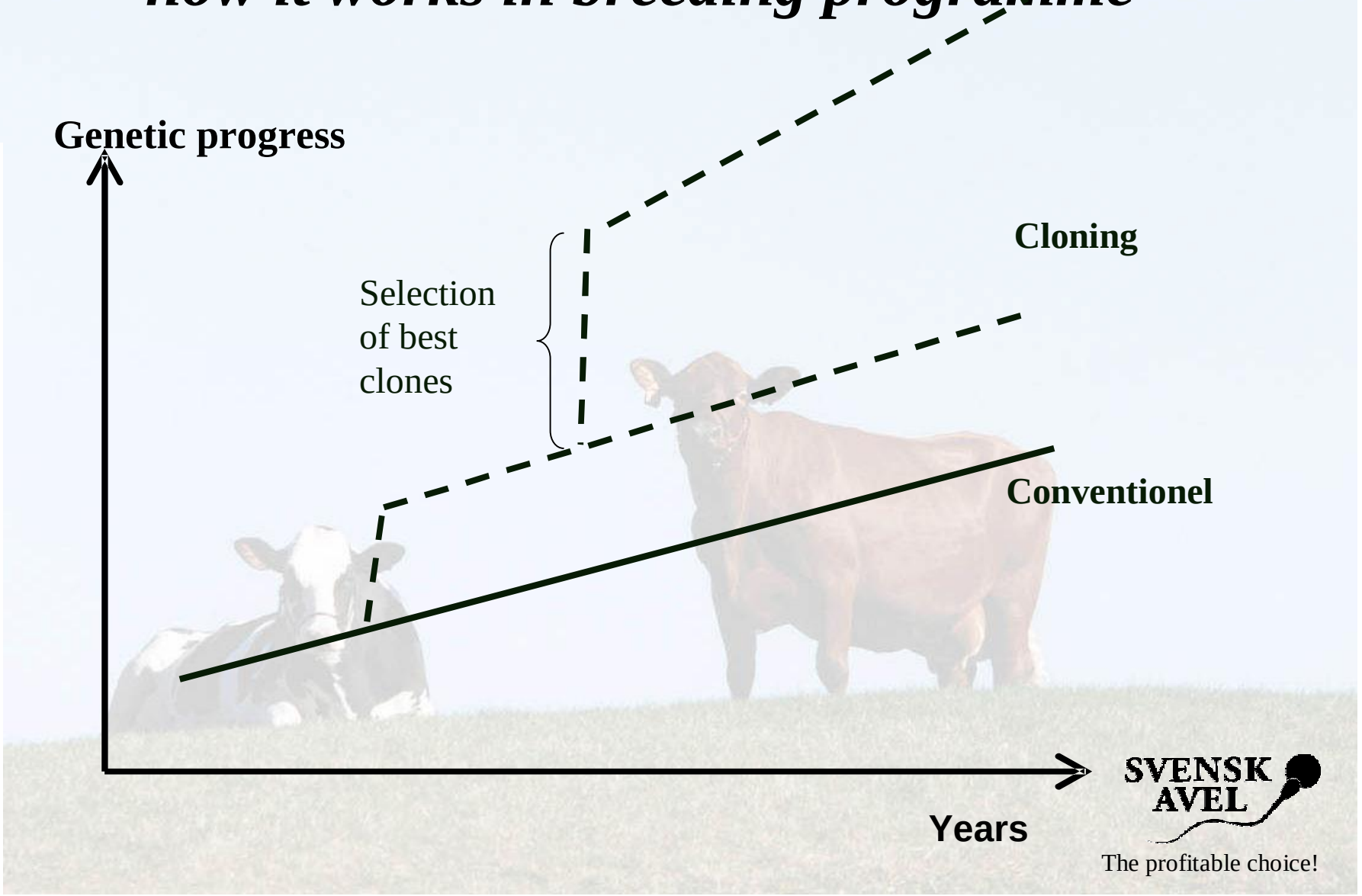
Cloning in dairy breeding

how it works in breeding programme



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Use of cloning in commercial herds
Example

Heifers:

Female calves for replacement

Total merit index + 15 →

15 × 35 → 525 EUR per calf

Cows:

Male calves for beef production →

Pure breed limousine → 300 EUR per calf

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Use of cloning in commercial dairy herds
Example

Clones for replacement

- Right sex
- Known production level
- Extensive use of beef breed cross for higher calf value

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Use of cloning in commercial herds
Example

Max extra payment per cloned embryo:

200-250 EUR

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Conclusions

- With the known technical level and success rate cloning has very **little importance** in animal breeding and husbandry.
- **Identity** (100 % equal to parent) of the animals should be solved.
- With a **success rate** at the same level of AI and ET, cloning may make a revolution in the cattle industry.
- When **cheap**, cloning may make a revolution in pigs or poultry.
- **Society acceptance is prerequisite** – technological development, transparency and society dialogue should go hand in hand.

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Rearing centre, Falkenberg

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Production barn, test bulls, Falkenberg

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Semen collection

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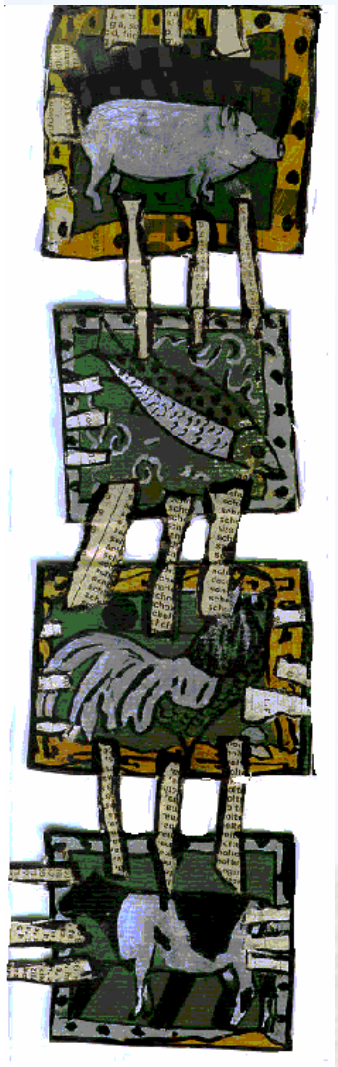
For genetic improvement testing is needed



- Progeny testing
- Clone test

The result depends on accuracy of estimated breeding values and selection intensity

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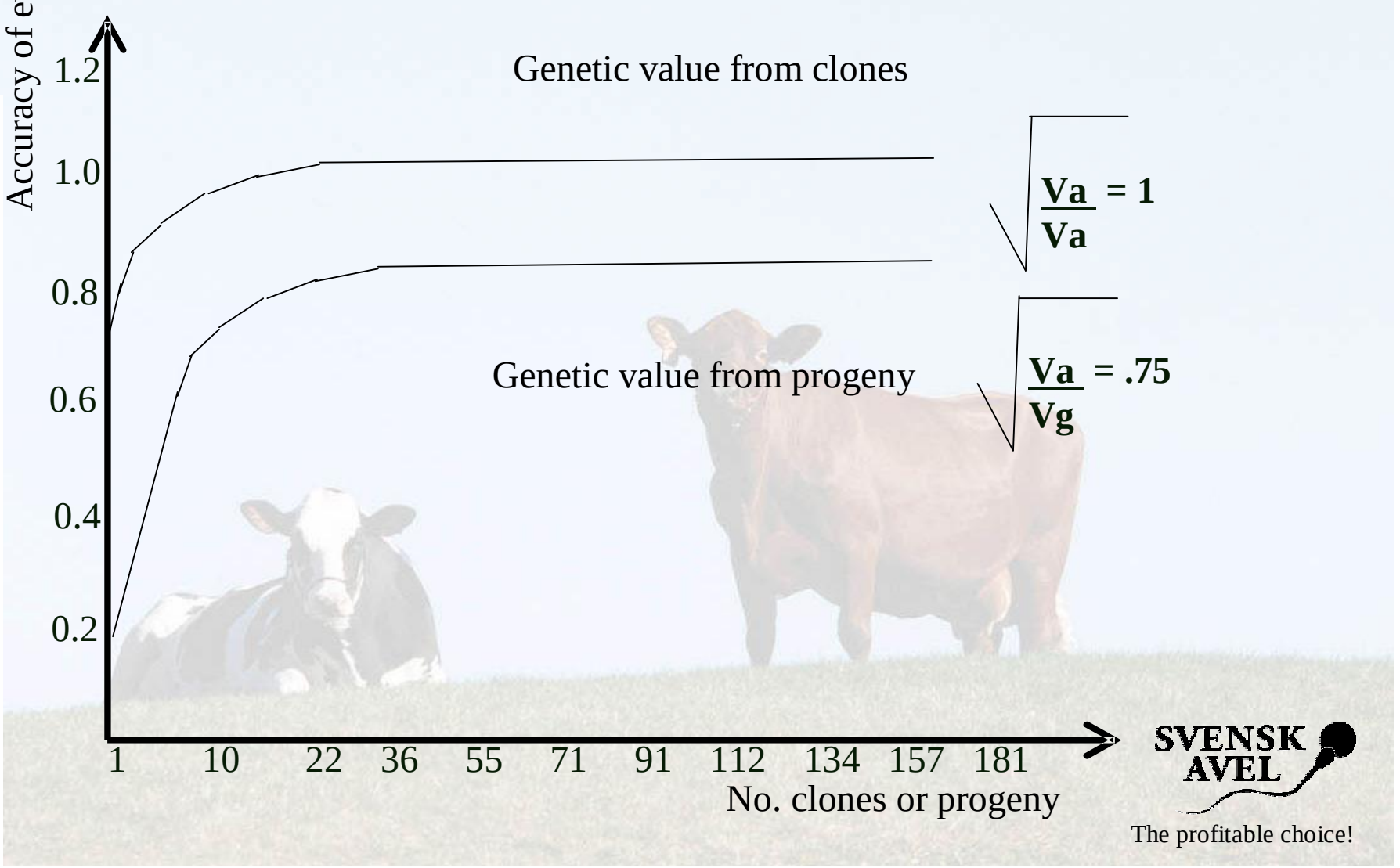
Accuracy of evaluation

of genetic value and breeding value, when the source of information is records on n *progeny, or* n *clones*



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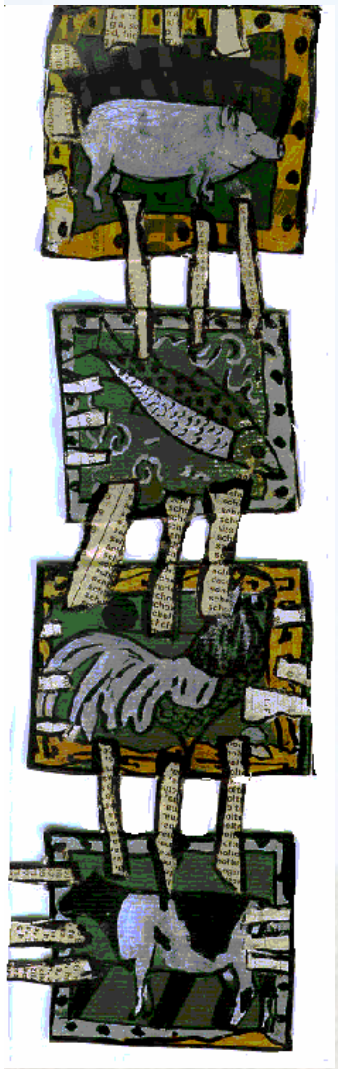
Finally….



Cloning is *not* genetic improvement

but

may become desirable especially on production level

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