Meeting of the sub-group on calves and dairy cows

Eleventh meeting, 07.02.2023, 9:30 to 16:30
(Physical meeting)

– MINUTES –

Independent expert	Francesca Fusi
Civil society organisations	EDA Eurogroup Slow food
Business and professional organisations	Farm & Animal Health Copa Cogeca
Member States	Sweden The Netherlands Ireland Denmark
European Commission	DG SANTE – Colleagues from Unit G3, E4
Guest	Ana Granados Chapatte and Clotilde Patry (EFFAB) Peter Mölder (FEFAC) Christoph Winckler (EFSA/EURCAW)

1. Welcome

The Chair welcomed the participants to the 11th meeting.

2. Overall presentation of the subgroup work

The Chair made an overall presentation of the work done by the subgroup during the previous meetings.

3. Presentation on "EFFAB cattle breeders' perspective and contributions to the revision of the animal welfare legislation" (EFFAB)

Breeding has hugely evolved and there is a big difference between first breeding strategies in 1970's-1980's focused mainly on production and the modern animal breeding since 2000's where breeding is directed to a combination of traits rather than focusing on production only.

The modern breeding aims to reach:

- Improved animal health and welfare
- Better production and quality of the products
- Better use of ressources while keeping genetic diversity
- Reduction of environmental impact
- Ensured food security

In Europe, genetics are owned by farmers and cattle breeding is dominated by cooperatives or farmers associations.

The code of good practices EFABAR for a responsible and balance breeding was developed by the sector in 2005. The code is based on recent developments and working systems for the last 17 years and is reviewed every 3 years. There are already six updated versions and the 2020 code is currently under revision.

The code EFABAR is based on six pillars: health, welfare, food safety, milk quality and genetic diversity. The modern cattle breading has ambitious objectives with a wide range of traits to improve. Under each pillar different criteria for cattle are used as breeding elements. Some examples are:

- Better use of ressources
    - feed intake and use
    - fertility
    - longevity
    - monogenic trait/effects
    - keeping genetic diversity
- Animal health and welfare
    - feet and leg conformation
    - claw health (relate to AH (animal health) and AW)
    - calving ease
    - udder conformation (related to animal welfare (AW))
    - polledness (related to AW)

    - metabolic diseases (e.g., ketosis)
    - positive sociability / interaction among animals within the group
- Better production and quality of the products
    - better milk quality
        - protein,
        - type of fat
- Public health and food safety
    - disease resistance and robustness
    - mastitis and other udder health issues
    - reducing use of antibiotics
- Reduction of environmental impact
    - reducing emissions (e.g., methane)
    - reduction carbon footprint

Functional traits are more difficult to select than milk production due to their low heritability, and low quantity of data. However, phenotype is not only explained by genetics. Metabolic disorders have a low heritability, but it is possible to work also on them. In the case of milk yield other factors like environment, feed, season, housing enter also into account.

The milk production curve has a typical shape (always a peak). In spite of this, the production level differs between breeds, and between individuals. For a same breed, with a same genetic potential it can be differences in milk yield for various farmers, which can be explained by different management practices (e.g., organic farming has a lower milk yield than conventional farming). When comparing GHG emissions per cow with milk production, to decrease GHG emissions management needs to be more efficient. However, there is a lot of variability, and milk production is only part of the equation.

Cattle breeding is taking advantage from advances in genomics and phenomics (genomic sequencing, etc). With the implementation of genomic selection in the main dairy breeds, genetic progress is also higher for functional traits. Whole genome sequencing has already had a significant effect on the efficiency of selective breeding and production of livestock. The combined use of whole genome sequencing, with advanced data collection, analytics, cloud computing, precision livestock farming and appropriate regulation could generate additional benefits in terms of reducing the use of ressources and environmental impact, while also improving animal health and welfare and reducing the use of antimicrobials in livestock production.

A Total Merit Index (TMI) is used in cattle breeding to evaluate the genetic potential of an individual for multiple heritable traits. There are positive and negative correlations between production traits (e.g., milk yield, protein, and fat yields) and functional traits (e.g., udder health, fertility, longevity). For instance, encouraging milk yield may encourage other traits as long as weight within TMI is high. An example of this positive correlation is the decrease on mastitis treatments between 2008 and 2018 with a decrease of antibiotic use, discarded milk and permanent milk loss. Benefits of genetic selection was there positive for farmers and society.

The TMI is constantly adapted to needs coming from society, consumers, and farmers. More and more new traits are included in the TMI, getting closer to the identification of genes affecting functional traits (including welfare), to be introduced in the genetic predictions, considering the diversity of the farming systems (organic, conventional, pasture-based, semi-intensive, etc.). For this purpose, data is essential.

More the genes responsible for traits are identified, more selection can influence them at population level. Those genes are better and better identified but need also to consider all different farming systems, and it is to the farmer to decide which direction he wants to follow.

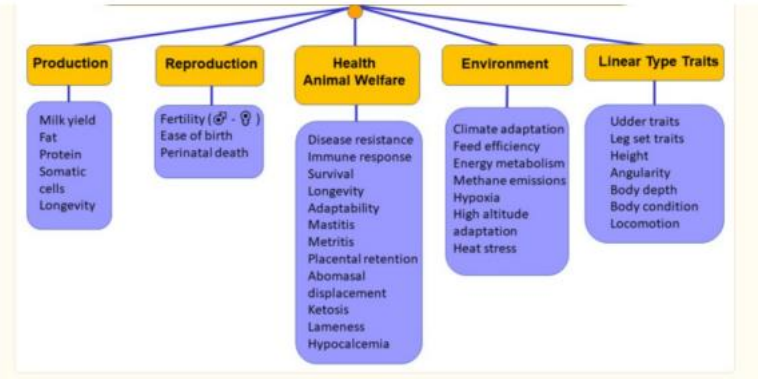

Figure 1: overview of new traits and phenotyping strategies in dairy cattle with a focus on functional traits. Egger-Danner C et al. Animal. 2015

Additionally, genetics allows for monitoring and managing. More and more heifers are genotyped from birth. An early estimation of the genetic potential allows for a better knowledge of individuals and can be used as a management tool for farmers, to adapt practices to this potential (e.g., feed, health, etc.) and respect animal welfare (for instance by avoiding a mismatch between the yield potential and the energy intake).

A breeding program should contain a balanced and responsible combination of many traits.

Cattle breeding and welfare legislation

- Observations are not only explained by genetics.
- Cattle breeders not only monitor milk production but many other traits: at animal and herd level, using breeding & management tools.
- Cattle breeders keep developing balanced breeding program for better health, welfare, sustainability, etc., to be able to react and adapt to changing conditions and needs.
- Using precise genetic tools: enhanced by farmers, science, and technological progress (computer capacity, sequencing, and collaboration).
- According to EFFAB, not considering the whole picture when regulating on milk production may endanger breeding programmes and sustainability.

Conclusions:

- Breeding in dairy is part of the solution. However, not everything can be solved by genetics.
- Animal Breeding programs (EU breeding associations) improve at the same time a group of traits, not only production nor health or welfare. It is a package.
- Self-regulation is in place through to the code of good practices and can be improved.
- Progress is measured and monitored.
- Regulation without considering the whole picture of balanced breeding, will only lead to limitations of breeding populations. According to EFFAB, legislation on a specific trait is not necessary because:

- Variation between animals (breeders work with entire populations), sometimes due to management and choices at farm level.
- As long as balanced breeding is performed, Animal Welfare is ensured.

Discussion

Questions were requested by the subgroup on the possibility to consider changing the lactation curve of cows, not to produce less but to lowering the pick, and increase its persistence, to allow for a longer calving interval (e.g., a few extra months beyond the canonical 1 year), which could increase longevity and fulfil ethical and consumers' expectations. The subgroup indicated that Germany is already implementing a longer calving interval, which increase longevity and profitability. Additionally, the subgroup asked EFFAB how was calculated the impact of other factors different from genomics and how was discriminated between genomics and environment effects.

EFFAB clarified that genotyping is computing all data to know what to do with the genomics and evaluate the effects. Making breeding is easier now than in the past, when only indirect evaluation was possible. However, it was explained that even if breeders were able to predict the lactation shape, sometimes the reality was different from the result expected based on the potential. In that case the farmer may need to adapt the management practices.

Regarding the longevity EFFAB confirmed that part of the objective is to decrease the length of the non-productive period. This would be more efficient and interesting from an environmental point of view. EFFAB pointed out that there are more and more farmers looking for having longer lactations and longevity. However, even if every change should be looked at with the perspective of the life level of cows and GHG emissions, this remains the choice of farmers.

The subgroup asked EFFAB if they anticipate that something could be regulated or if they believed that breeding should not be regulated at all. EFFAB explained that for cattle and pigs there is already a regulation for breeding. EFFAB considers there is no point to regulate as far as a balanced breeding is done, and on the contrary, if regulated, breeding could become unbalanced.

The subgroup pointed out that breeding has a huge impact on performance, and breeding for increasing performance is not positive for animal welfare (AW) in general. In Denmark, a ministerial working group was set up in 2010 to reflect on which measures could be implemented to remedy negative animal welfare consequences of breeding animals, including any legislative measures. This working group recommended that breeding should not be regulated by specific legal requirements for the breeding of farm animals.

The subgroup considered problematic that data from breeding companies is not accessible, as data on breeding and its effects on animal welfare could be used as an indicator.

EFFAB replied that all data are in principle available in national databases on breeding programmes. Breeder companies also have difficulties to access national data. On the question of using data as animal welfare indicators, EFFAB was of the view that it is difficult to use breeding data to measure animal welfare, as observations can be misinterpreted.

One member of the subgroup requested clarification on how TMI is calculated for different breeds which perform differently.

EFFAB explained that TMI is a common tool for all breeds. Farmers come with specific requests depending on the result they want to obtain. This is included in the way TMI is calculated. It is important to maintain genetic diversity to be able to adapt to future demands.

The subgroup highlighted that in the recent years the phenotype of cows has changed, and cows have become taller, and less robust. The subgroup asked EFFAB on the connexion with animal welfare of these phenotype modifications.

EFFAB explained that they are not able to make the connexion between both. However, EFFAB agreed that the most the cow is taller the most the cow needs energy to maintain its body, and it would be better to come back to a smaller format as before.

The chair of the subgroup asked to EFFAB how the legislation could help to ensure a balance breeding strategy is kept.

EFFAB considered that the code is a transparent way to self-regulate. It could be useful to have a definition of balance breeding, but how to introduce this in the legislation is not clear. EU companies are leaders in knowledge and are leading this balance. Introducing legislation is not the best way on the opinion of EFFAB, as it is linked with knowledge.

Some members of the subgroup indicated that breeders should pay more attention for keeping local breeds. EFFAB confirmed that some mix beef traits have been introduced in TMI.

4. Presentation on "feeding management of fattening calves and welfare" (FEFAC)

The results of a study on developing novel feeding strategies to improve the welfare of veal calves were presented. In the study, it was given free choice of feed to calves providing roughage (long hay and long barley straw (1-5 cm)), concentrate, and maize silage (muesli) from two weeks of age in addition to milk replacer by automatic feeder until 25 weeks of age. Additionally, calves in groups of 5-10 animals received free access to water from 2 l/meal at week 0 to 6,5 l/meal at week 25. When providing iron through roughage, the level of iron was controlled after 10 weeks.

The study showed that calves continued milk intake for the whole duration of the study, and there was high variation in the individual calves' intake of solid feed. However, a preference for concentrate was shown, followed by milk replacer and water and then hay. Intake of maize silage and particularly straw were much lower.

The milk replacer was composed by whey powder from cheese, coco oil and extra protein (from dairy or vegetal protein). Automatic feeders could dispense milk replacer 3-5 times per day, but in general they provided milk twice a day.

The effect of the amount, source and particle size of roughage was studied, showing that there is a big impact of giving straw or hay to help for expressing normal behaviour (e.g., rumination) with no difference between both hay and straw, but with a preference from calves for hay.

The current feeding schemes are quite similar to the calves' preference, and huge amounts of CMR (calf milk replacers) (i.e., 18 liters per calf per day) are not provided anymore. There is and individual variation in the calf preference, and in the current practice calves can chose between CMR and TMR (total mixed ration). TMR is offered *ad libitum* in troughs.

At 12 weeks of age, there was around 15% of time rumination with hay or straw and ≤ 5 % with no roughage and only milk replacers. No roughage promoted tongue play, oral manipulation of trough and in a less extend of pens and pen mate. Hay and straw both had a positive effect on tongue play behaviour and low impact on oral manipulation. As calves could select their own diet, 1000 g/ calf/day of NDF was never reached and 30% of rumination time was not achieved. The current feeding plans used are close to the mean intake of milk replacer and solid feed chosen by the calves in this trial. There was no effect of extra iron provision on behaviour.

Discussion

The subgroup requested the presenter about the provision of roughage in practice in veal sector. The presenter explained that roughage is provided ad libitum, but to avoid having too red meat farmers play with the quantity of milk replacers given, as calves prefer milk. Regarding iron, farmers in general provide extra iron 1-2 weeks after arrival to the veal unit and control the blood iron level to ensure sufficient haemoglobin levels (far above the current legal requirements). Iron is again controlled after 10 weeks.

The presenter considered very ambitious to reach 30% of rumination, as this requires a very high amount of NDF/day. Giving only hay was considered a business issue due to high iron content; and stopping veal production is a problem for the dairy sector: the white veal sector uses about 20% of the whey from cheese production in the EU. Furthermore, according to the presenter, the use of milk besides solid feed gives a much more efficient use of nitrogen, phosphorus, and less methane emissions than with the use of solid feed only.

The subgroup highlighted that giving iron shots instead hay was detrimental for animal welfare. The presenter recognised that iron shots are painful and stressful. According to the subgroup 60-80% of calves are concerned by a lack of iron at 2 weeks and asked the reason why iron is not corrected through feeding instead, as this concern 80% of calves. The presenter explained that the discard of 20% of calves with too high red colour due to variations when providing hay would have a very high economic impact, and farmers consider easier to correct iron levels through injection rather than through provision of roughage. The amount of extra iron needed differs between calves and with iron via the feed this amount per calf is not manageable. s.

The subgroup showed interest on how veal farmers deal with suckling reflex in veal units. The presenter explained that some calves are provided with teats, but more often they have buckets available, for hygiene considerations. It was confirmed that sucking behaviour is a problem in veal units at a very young age

On the question about the lower provision of colostrum to male calves, the presenter stressed that the key is to have a good relationship with dairy farmers providing calves, to ensure he/she gives enough colostrum of good quality with a correct protein content. However, both the presenter and the subgroup agreed that it is often complex to connect veal and dairy farmers.

The subgroup requested the presenter his experience on the impacts of the minimum requirements on age for transport. The presenter confirmed that since these requirements have been established, mortality has decreased and considered these requirements useful as the older calves are transported, the more robust and heavier they are and then the better is as they have less problems. For veal is certainly better, however, costs are passed on to dairy farms.

5. Cow-calf contact (CCC) systems and animal welfare (EURCAW/EFSA)

According to Directive 2008/119/EC, calves must receive bovine colostrum within the first six hours of life. However, there are no legal requirements on cow calf contact, apart from a few exceptions in some organic national legislations (i.e., 24h cow-calf contact in Sweden and Denmark).

There is an increasing interest among consumers and dairy farmers, not only in the EU but also outside the EU (e.g., US, Brazil), in systems allowing prolonged contact between cow and calf during early life.

CCC systems are not “a” system but many systems depending on the:

1. Cow:
    - Dam-calf system
    - Foster cow system
2. Type of physical contact:
    - Full CCC
    - Partial CCC
3. Duration of daily contact:
    - Whole day
    - Part-time
    - Several short times a day

Situations are very different among Member states (MS), and also within the same system. CCC was investigated in 104 farms in the EU, in Austria, Switzerland, Germany, Italy, and Sweden (Eriksson et al., 2022), showing that the pattern is very variable across systems. In the farms involved in the study, in Italy and Austria, the dam is used in >50% of cases but the duration of contact allowed varies substantially. In France, farmers allow more permanent contact, Italy mainly around milking. The average duration of the suckling period also varies among MS, being around 7 weeks in France, 10 weeks in Austria, 15 weeks in Denmark and Sweden, 20 weeks in Switzerland and more than 25 weeks in Italy. A very high suckling period was observed for Moricana breeds traditionally used in Sicily (around 45 weeks).

In the natural maternal behaviour, the dam often separates from the herd before parturition (hider species). For the calf, the cow is the only/important social partner during the first days/weeks of life. By 4 days post-partum the cow-calf bond is fully established, and weaning occurs at about 8-12 months of age. Later, the calf remains a preferential social partner for the cow.

Welfare consequences of limited cow-calf bond for calves

Welfare consequences of limited cow-calf bond for calves are linked to:

- **Inability to perform sucking behaviour** due to short sucking duration in artificial rearing (1h against 8 h in average in natural behaviour) and infrequent milk intake, leading to a risk of development of abnormal oral behaviours, mainly cross-sucking of navel or preputium of congeners. The proportion of animals showing cross-sucking behaviour is high at around 4 weeks of age and increase until 10 weeks of age. After 10 weeks, this proportion decrease drastically, becoming low around at 15 weeks of age. Cow-calf contact help for dramatically decreasing this behaviour.
- **Prolonged hunger**
  The amount of milk fed in standard artificial rearing is often lower than when suckling the dam/foster cow or when provided ad libitum milk (up to 18 l/day). In artificial rearing systems, calves receive twice a day meal feeding.
  Weight gain in CCC calves may be higher but is dependent on the access to suckle the dam, number of calves in foster cow systems and milk allowance on artificially reared calves. According to the elicitation exercise on cross-sucking prevalence, in a foster cow system, cows have around 4 calves/cow and calves do not have as much milk as they would like to drink.
- **Isolation stress** especially in individually housed calves.
  CCC calves exhibit higher social competence than group reared controls. CCC have long term effects on social behaviour, like better integration into the cow herd and less aggressions.
- **Separation stress** is one of the most frequent challenges reported and is depending on the duration of the cow-calf contact and method of weaning. The separation stress is

characterised by restlessness, high pitch calls, etc. Increasing the age at weaning and performing a two-step/gradual weaning seems beneficial (e.g., through fence-line or nose flaps). Nose flaps are more and more used, but cause ulcers on the nasal septum.

- **Health**
    - There is a risk of failure of passive transfer; however, no difference has been found between CCC and artificial rearing (mainly due to bad quality of colostrum).
    - The contact to older animals may increase the risk of transmission of infectious agents, but hygiene conditions appear to be more important than the contact itself.
    - Effects of CCC on occurrence of diarrhoea have been considered inconclusive.
    - CCC leads to strong motivation for maternal behaviour, and to access the calf, even when separated shortly after birth. CCC has shown potential health benefits of increased oxytocin levels, e.g., less retained placenta. However, benefits of performing maternal behaviour are only seen in dam rearing systems.
    - CCC causes separation stress after bond has been established. Foster cow systems are less well researched, but there are indications that cows can also be stressed (depending on number of calves) causing health problems, including udder disorders.

Challenges for farmers

The main challenges for farmers in CCC systems are:

- Less saleable milk. However, the gap decreases when considering the feeding recommendation of 20% body weight of milk. After weaning, cows reach a milk yield level comparable to control cows.
- Milk let-down problems.
- Separation stress.
- Need of adaptation of the housing system (e.g., creep area).
- Integration with pasture in the case of organic farms.

Conclusions:

- Calf benefits of cow-calf contact (e.g., sucking behaviour, no cross-sucking behaviour, social competence and weight gain) increase with the duration of contact.
- Calves kept with a cow in the preweaning period show nearly no cross-sucking behaviour.
- More research is needed:
    - for mixed systems combining CCC with artificial rearing,
    - for the level of separation stress between weeks 4 and 10,
    - practical strategies for CCC systems on a large(r) scale.
- Prolonged cow-calf contact should increasingly be implemented.

It was considered that a compulsory CCC of at least 24h in the legislations is a good start, to be increase later if possible.

Discussion

The subgroup requested how it was looked at the performance of the calf. The presenter explained that there are two studies on prolonged behaviour after CCC. Statistics indicate that calves perform better, but maybe they are not properly comparing animals on different systems. Studies are quite small as they are expensive.

The subgroup considered having a foster cow already a good improvement. Regarding the start of separation stress, the presenter confirmed that the bond increases linearly until 4 days; the separation stress appears after 4 days but can be already present after 2 days. To prevent separation stress, it was recommended to keep the calf with the dam less than 3 days, and to completely avoid it only 24 h. Keeping the calf with the cow for 2 to 4 days was considered having no real interest.

The subgroup highlighted the differences between dairy and meat productions, where meat calves can stay with cows until the next calving, which is not possible for dairy.

Regarding differences between breeds, it was explained that even if there are no studies available it seems to be differences when comparing different breeds (e.g., more cross-sucking observed with the Simmental breed).

On the question if the market could establish limits, it was told that market could solve only part of the problem (e.g., by using labels). However, there is a need to precisely establish the border (what is the minimum contact, how long, etc.).

6. Discussion

The question of the size of farms for specific requirements was raised, and the possibility to have a definition for small, medium, and big farms.

The subgroup stressed that for EFSA, a small dairy farm is less than 75 cows according to the ToR provided by the European Commission, however, according to literature and national plans (e.g., in Italy) a small farm is defined as a farm with less than 50 cows, which could be considered still big in certain Member states as there are very different situations depending of the country (e.g., in Poland a small farm is below 20 cows, in Spain a 100-cow farm is a small-medium farm). There is no definition in the CAP regulation for small, medium, and big farms. In Member states like the Netherlands, the size of a farm is defined by the number of staff but, even with the same number of staff, the size varies a lot depending on the level of the automatization. The question of “active” farmers was also raised.

The subgroup discussed the possibility to require AW plans and shared the opinion that because the AW legislation is for all animals, the same requirement should apply for all farms independently of the size. The AW plan must be specific for each farm. However, to avoid a disproportionate administrative burden in detriment of animals, simplified procedures could be required for smaller farms, like is already implemented in food systems for HACCP requirements. The subgroup also considered necessary that AW plans are regularly reviewed and proposed an annual frequency for big farms and a review when something happens for small farms.

The subgroup looked into the matter of indicators and considered that it is important to have iceberg indicators. Mortality was pointed as one of the relevant indicators together with body condition (BC) and cleanliness (already used in certain MS). However, the subgroup called for caution when establishing threshold for indicators as, for instance, a prevalence of 20% is not the same for 5 cows than for 50 cows; if there is a small number of cows, it cannot be expected to have 20% all the time for lameness for example. The possibility to have cumulative prevalence was then explored but was considered less easy to check while the recurrency of a problem was easier to monitor. On the frequency of reviewing indicators, it was considered that thresholds should be regularly reviewed, however, no frequency was proposed.

The subgroup also called the attention to avoid mixing roles and responsibilities: the veterinarian of the farm must document the situation in the farm and those documents are checked by the official inspector. However, if problems become recurrent, is up to the MS to sanction and establish the

follow-up needed (e.g., in Denmark, in case of sanction two follow-up inspection are imposed and inspections are paid by the farmer; risk assessments are performed by some MS based on indicators and compliance with individual health plans to establish inspection frequencies and target farms).

The question of who should perform the AW visit was also discussed. The subgroup considered that veterinarians of the farm could do it, but also private companies, or other. This question has already generated some debate in several MS, particularly because veterinarians visiting regularly the farm consider it problematic.

7. Calendar for the next meetings

The group requested to have a meeting after the publication of the EFSA opinions on calves and dairy cows and have ahead of the meeting a comparison between the outcome of the subgroup ad the conclusions/recommendations in the EFSA opinions.