

Extreme pig breeds: The need to reorient breeding efforts

Deshpande Chandrika¹, Dr. M. Sreedhar Reddy²

Abstract: The very name of the issue, "Qualzucht," means "extreme breeds" in German. In the world of companion animal breeding, the most popular species, sometimes referred to as "extreme breeds," are Pugs and French Bulldogs. Research into, among other things, health problems caused by breeding practices has led to the widespread use of the term "extreme breeds" in this field. In this context, the labels "hyper types" or "torture breeding" are also employed. All of these terms have the negative connotation that people often associate with them. Instead of "torture breeding," the term "high-performance breeding" is used when referring to domesticated animals. What sets this apart, what are the concerns raised by animal welfare advocates, and can you think of any specific instances of over breeding in pigs and other agricultural animals? An examination of the literature on the topic of torture breeding in fattening pigs and sows is presented here, along with an explanation of why various approaches are necessary.

Keywords: Pork, qualzucht, torture, abnormally large litters, myopathies, osteochondrosis, and extreme breeding

Introduction

There is a lot of talk, based on expert findings and views, about the practice of torture breeding in domestic animals. However, when discussing domesticated animals, the phrase "high-performance breeding" is still used rather than the more accurate "agony" or "torture" breeding. Therefore, what is the cutoff? Is it really reasonable to assume that breeding methods, for pigs, do not inflict any kind of pain, suffering, or injury on the offspring? According to §11b of the German Animal Welfare Act (Tierschutzgesetz), torture breeding occurs when it is presumed that genetically determined pain, suffering, or injury would be experienced by the animal or its progeny as a result of breeding tactics or bioengineering. Given the long-standing prioritization of high-performance above fitness- and health-related metrics, it is reasonable to assume that this also applies to farm animals in some instances from an animal welfare perspective. This article

reviews the research and uses it to define "torture breeding" as it pertains to pigs in traditional agricultural methods.

Review

According to the BMEL's interpretation of §11b of the German Animal Welfare Act which prohibits torturebreeding, one speaks of agony breeding, if a vertebrate is caused pain, suffering or harm through genetically determined features, morphological or physiological changes or behavioural disorders [1]. According to the German Animal Welfare Act, paragraph 3 number 1 also bans demanding performances from animals, which obviously exceed its strength [2]. Anyhow, the aims and strategies of high-performance breeding (which are highest performance, mass production, improvements in productivity and maximizing profit) demand

highest requirements from the animals. Resulting from these breeding strategies is the so called performance- related health disorder [3]. This describes a katabolic phenomenon and

pathological processes, both of which are linked to high performance and connected breeding strategies. Also common terms are “production diseases” [4] and “production related disorders” [5]. Bergmann (1992) [6] differs in primary performance-related health disorders (the problem directly resulting from the breeding strategy itself) and secondary disorders. The selection of abnormalities as in blue and white Belgians, would count for a primary one. Typical performance-related disorders are, as described in literature, reproduction disorders, udder- and claw-infections, lameness or pathological heart- and circulation-problems and so forth. But also behavioural disorders are apparent in high-performance-breeds. All those problems have to be graded as highly relevant from an animal welfare point of view. They are often linked to pain and suffering and strain animals and their health and welfare enormously [7]. Nowadays these “disorders” are considered as every-day problems and their treatment takes place in veterinary medicine studies.

A counterpart is the so called “Erhaltungszucht”, a German term describing conservational breeding strategies. It emphasizes general fitness, genetic diversity, sustainability and multi-use-breeds [8], conserving geno- and phenotypes of the underlying breeds. Multi-use breeds are seen as insufficiently productive in high-performance breeding, the main reason why those breeds are nowadays largely threatened with extinction- for example almost all German domestic pig breeds [9].

High-performance and torture breeding in pigs have already been examined in literature, with the most popular examples being the number of weaned piglets per sow and osteochondrosis and myopathies in fattening pigs. The number of piglets per litter [10] and weaned piglets per sow and year are the most important economical parameters in pig production, which was focused on over decades. Through shortened suckling periods and breeder’s interfering with litter sizes, the economical parameters were constantly increased. Parallel to increasing numbers of live born piglets the number of dead born piglets increased as well though [11]. Also the shortened suckling period leads to increased health-stress for

the sows, because time for involution of the uterus is shortened as well. Shorter suckling periods than 21 days are not sensible, as the involution of the uterus needs at least 18 days. Therefore EU-regulations banned suckling periods of less than 21 days for a good reason [12]. Short suckling periods favour the development of reproduction-disorders and can reduce life expectancy of sows

[13]. Piglets weaned earlier are described as frail because of lower weight at weaning and the younger age. Another problem is that sows give birth to more piglets per litter, than they have teats to suckle those. Therefore the redundant piglets have to be raised with natural or artificial foster sows or any other complex management. A direct consequence to the massive litter size is however, that because of limited uterus capacity, birth weight of piglets is increasingly inhomogeneous and considerably lower. This again increases piglet losses due to hypothermia, hypoglycaemia and crushing [14], distinctly: While breeding towards higher number of piglets per litter, the capacity of the uterus stayed widely unnoticed. That means, more embryos nest in the uterus than physiologically reasonable and therefore cannot develop homogeneously and adequately. Also the nutrient- supply in the uterus is limited, which leads to prenatal competition between the piglets. The direct result is a higher amount on underweight and faint piglets, born with low energy reserves and therefore a higher risk of dying of hypothermia and hypoglycaemia or being crushed. Studies showed that vitality of the piglets directly correlates with the number of piglets per litter. In brief, decreasing losses in suckling piglets, which has a clear relevance from an animal welfare point of view, can only be reached genetically through breeding towards smaller litter sizes [15].

Regarding fattening pigs breeding strategies for a long time focused on a high lean meat percentage. This resulted in myopathies, also called sensitivity towards stress. This disease complex includes degeneration of muscles, disorders in the heart- and circulation-system, possibly leading to the death of the animals. The responsible defective gene resulted directly in breeding for higher lean meat percentages and is prominent in breeds with high growth rates and a high abundance of meat

[16]. Those breeds, e.g. Pietrain, especially tend to develop myopathies [17],[18],[19],[20]. Regardless Pietrain pigs are the most common breed used on the boar's side for the production of fattening pigs [21]. The heavy muscling does not result of more, but thicker muscle

fibres with a higher calibre of muscle cells [22]. Early studies showed a prevalence of 65-100% regarding sensitivity towards stress, with no other breed combining such high lean meat percentages with such high stress sensitivity. By now, so called MHS-tests are used to find out NN- and NP-animals for breeding [23]. The breviation "MHS" stands for malignant hyperthermia syndrome and characterizes the underlying defective gene [24],[25],[26]. MHS positive pigs show a massively higher susceptibility to sickness and a higher mortality [27],[28]. Fujii et al. (1991) were the first authors to identify a mutation in the so called Ryanodin- receptor-gene, which is said to be causing the myopathy [29]. These results were confirmed by different authors and are widely acknowledged by now. To provoke the MHS certain triggers are needed [30],[31], such as stress due to transportation, regrouping, fights for hierarchy, fixation of sows, or birth [32]. Bickhardt (1996; 1997; 1998) stated, that hybrid pigs which were bred for high lean meat percentages and high growth rate can possibly react with a deadly myopathy to normal, physiological stressors [33],[34],[35]. According to Wendt (2004) the pathomorphological disorders regarding the myopathy in pigs are ranged as relevant welfare problems, especially regarding §11b of the Protection of Animals Act [36]. Wendt et al. (2000) stated that pigs carrying the mutation in their genome are certainly caused harm, pain and suffering, which washes away any doubt as to this sickness being massively painful and, as the author states further on, shows that animals are widely unable to cope with their housing and production systems, as even physiological stressors can lead to deadly myopathies [37]. Matzke et al. (1985) also conclude that selective breeding towards high meat percentage has lead to diminution of adaptability regarding environmental factors [38].

The second problem regarding breeding strategies

in pig production is high growth rates in fattening pigs leading to pathologically degenerated joints due to osteochondrosis. The juvenile skeleton cannot cope with the high growth rate of the musculature, authors describing prevalences of 55-90% [39]. Osteochondrosis counts as main cause for lameness in pigs [40],[41] and is described mostly in fast growing pigs [42]. The connection of the disorder and the high growth rate as well as high meat percentage is widely accepted by now, as literature proofs [43],[44],[45],[46]. Bickhardt (1998) states that high growth rates and high meat gain are suggested as the main reason for osteochondrosis [47]. Even the German federal government accepts that osteochondrosis in pig production is an undesirable development resulting from selective breeding [48]. In spite of scientific knowledge about the genetic disposition of osteochondrosis [49],[50],[51], it is a so called multifactorial disorder [52],[53]. Clinical symptoms develop in four to six months old pigs and can range from indefinite leg disorders to massive lameness [54]. Dewey (2006) described the clinical signs as chronic and progressive lameness [55]. Affected animals develop increasing disorders in their movement [56]. They show pain while standing up, move around very stiffly [57], have massive weaknesses in their hind limbs and abnormal disorders in their posture [58]. It is obvious that osteochondrosis has a negative effect on the welfare of the animals [59]. Wendt (2004) expects pain and harm for the affected pigs, which is relevant in the regard of the Protection of Animals Act [60]. Other authors confirm that osteochondrosis has to be classified as painful [61],[62],[63]. Bickhardt (1997) and Wendt et al. (2001) call the osteochondrosis a painful sickness of the joints and a massive infringement of the idea of animal welfare [64],[65]. Herzog (2001) suggested to start genetic selection to diminish osteochondrosis, because selection on daily weight gain transgresses §11b [66]. Pursuing genetic selection as practiced until now could even worsen the situation [67].

Conclusion

In all farming animals we can distinguish similar aspects: Tibial dyschondroplasia in poultry, osteochondrosis in pigs and cattle, ruptures of the aorta and sudden heart failure in poultry and

myopathies in line with circulation- disorders in pigs. In all species we repeatedly find similar disorders resulting out of the same basic problems: genetic selection towards high and fast weight gain and generally high performance, leading to an overload of the skeleton and the inner organs. Steadily increasing performance parameters in animals by means of breeding strategies affects health and fitness of the animals in a negative manner. Certain disorders and diseases are direct results of the high productivity. This is widely accepted even though the Animal Welfare Act has been prohibiting torture breeding since 1986. Sadly the enforcement of §11b regarding breeding strategies of farming animals has not yet happened [68]. Stricter enforcement of §11b in Germany and Europe in general should be aimed at from an animal welfare point of view. Also discussions about more animal welfare in modern farming

systems need to refocus and from now on include breeding strategies as already happening in other countries. Austria for example included piglets' vitality scores in their breeding agenda, because

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the piglets' fitness and vitality corresponds directly to litter size and birth weight, as scientists showed [69]. The more the piglets weigh at birth, the higher the score, therefore showing the genetic link between litter size and piglet losses. Using the vitality score for genetic selection, could reduce piglet losses on a long term. A Norwegian breeding company for example, focuses on robustness, including e.g. vitality and stability of extremities. Also mothering ability in sows, homogenous litters and the social skills of pigs are important factors for their selection. All of which are providing good results. What does that show us? Germany and other countries need to catch up! Breeding towards even higher litter sizes or thicker muscle fibres is simply wrong, not only from an animal welfare point of view. Fitness, robustness and high vitality in suckling piglets must be the goals for modern farming and breeding, especially in terms of a potential future with free farrowing systems. It is important to draw attention to this important topic and change the focus of breeding strategies for more animal welfare in modern farming in the future.

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