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EFFECT OF THE QUALITY OF HANDLING AND CARE ON THE REPRODUCTION PARAMETERS OF MINK

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Abstract. The aim of this study was to determine the effect of animal handling, defined as the so-called human factor, on the level of reproductive parameters of female mink. We analyzed some reproductive parameters of 6 348 one- and two-year-old Scanbrown females, such as fertility, prolificacy and rate of rearing the young. Mink were divided into four groups; group I and II consisted of one-year-old females, group III and IV comprised females at age two years. Individual groups of females were operated by four different teams of workers. The results indicate a strong influence of the quality of care on the parameters of breeding.

Keywords: animal handling and care, fertility, mink, prolificacy, weaning success

INTRODUCTION

Results obtained by breeders, which translate into profitability of breeding, depend not only on genetic factors but also on environmental conditions. According to Herman [1986], only through appropriate modifications to the entire group of environmental factors, can the breeder maintain the desired direction of the improvement of the breed, in order to obtain animals with high quality pelt and a high level of reproductive characters. One of the major environmental factors, which plays a vital role in achieving the goals of the production progress, is the appropriate handling of animals.

Herbut [2009] points to a strong human impact on the environment and welfare of the farm animal. For example, on a poultry farm, the author found that the higher production results were achieved if the service had been better and people more caring for the animals. The author divided the human impact into the direct and indirect one. Indirect impact is to ensure adequate animal welfare (buildings, feed, climate of the rooms, technology of maintenance, etc.), and the direct effect consists in the contact with the animals. Accord-

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ing Herbut [2009], people working with animals should be characterized by gentleness, diligence, good manners, and have a good knowledge on the animals' ethology.

On fur-animal farms in Poland, the human impact is often underestimated. Zwierzchowski [1984] reports that the losses connected with still-born and pre-weaning mortality is several times greater than the mortality resulting from poisoning, infectious diseases, or parasites. The author blames farmers for this situation, since most of them consider such losses as inevitable, never trying to critically examine their underlying causes, whereas in many cases the failures may just result from negligence, handling errors, or sheer lack of knowledge. Well-known is the fact that the results of farm animal breeding are determined by the genetics; however, the reproductive success also largely depends on environmental factors [Lohi 1993, Maciejowski and Jeżewska 1993, Valtonen 1993, Lorek 1996, Rozempolska-Rucińska et al. 2000, Sulik and Felska 2000, Socha and Markiewicz 2001, Socha and Kołodziejczyk 2006]. Baseing on the genotypes of individuals we may predict their certain level of productivity, but the complete manifestation of this potential is only possible under the best conditions of rearing [Kuźniewicz and Filistowicz 1999].

The aim of this study was to analyse the effects of proper animal handling, defined as the so-called human factor, on the level of selected parameters of reproductive traits in female mink.

MATERIAL AND METHODS

The study was conducted on one of the largest mink farms in Poland, located in Western Pomerania, in 2009. Animals were housed and fed according to generally accepted standards. In this paper we provide the analysis of selected parameters that characterize female reproduction, such as fecundity, fertility and rearing rate.

The experiment involved a total of 6348 Scanbrown females mated to males of the same colour variety. The animals were divided into four groups of which groups I and II consisted of yearlings and groups III and IV consisted of two-year-old females. Each group of females was handled and cared of by another team of workers, according to the following scheme:

Group I: 1588 yearlings handled by the team no. 1.
Group II: 1595 yearlings – team no. 2.
Group III: 1583 two-year-olds – team no. 3.
Group IV: 1582 two-year-olds – team no. 4.

The resulting data were processed statistically using the Statistica®PL software package.

RESULTS AND DISCUSSION

Monoestral type of breeding, characteristic of the mink, manifested by a short, 2–3 weeks' long mating season means that even some slight negligence of the breeder may lead to significant losses on the farm. Unfortunately, to date, not all breeders are aware of

the fact that incompetent handling of animals is one of the direct causes of a decline in the number of offspring born and weaned, due to a large percentage of unmated females, or those miscarrying or destroing the litter.

The study shows that the fertility of the analyzed females, both in one- and two-year-old animals, differed depending on the team of workers taking care of the group. In the case of one-year-old females, team number 1 proved to be better, and reached nearly 3% growth of the analyzed traits in relation to the team number 2 (Fig. 1). However, among two-year-old femlaes, the employees of the team no. 3 achieved better results, since the value the of aforementioned characteristics exceeded 86.5%, while team 4 received only a score close to 85% (Fig. 2).

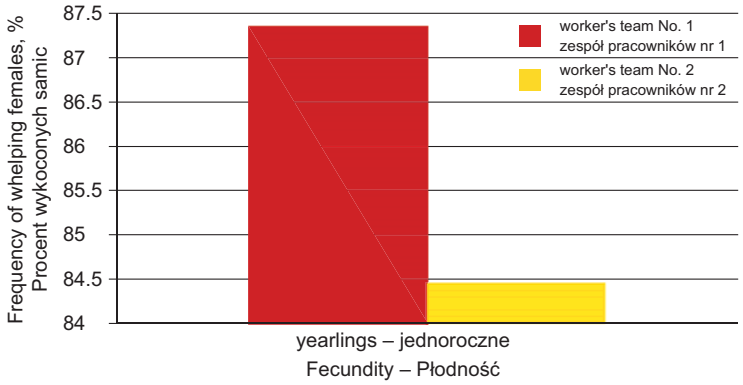


Fig. 1. Frequency of whelping, one-year-old females by operating team
Rys. 1. Procentowy rozkład liczby wykoconych jednorocznych samic w zależności od zespołu pracowników obsługujących

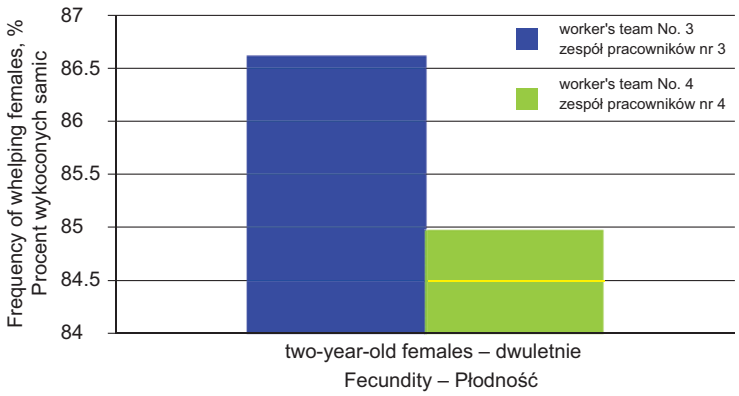


Fig. 2. Frequency of whelping, two-year-old females by operating team
Rys. 2. Procentowy rozkład liczby wykoconych dwuletnich samic w zależności od zespołu pracowników obsługujących

In both analysed age groups of females differences were found in the number of both mated though non-whelping (miscarying) and whelping that did not reared offspring (destroying litters), in relation to the team of workers. Like in the previous case, here also team no. 1 achieved better results in one-year-old females, while team no. 3 in the two-year-old group. The females being taken care of by teams 1 and 3 were characterised by a lower percentage of both miscarriages (Figs. 3 and 4) and unsuccessful maternal rearing (Figs. 5 and 6).

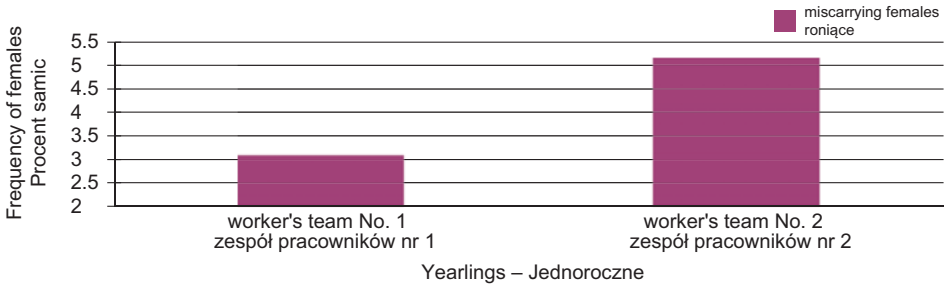


Fig. 3. Frequency of miscarrying one-year-old females by operating team
Rys. 3. Procentowy rozkład liczby roniących jednorocznych samic w zależności od zespołu pracowników obsługujących

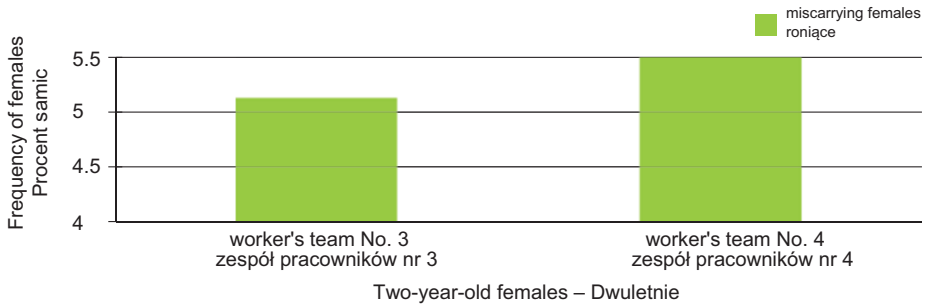


Fig. 4. Frequency of miscarrying two-year-old females by operating team
Rys. 4. Procentowy rozkład liczby roniących dwuletnich samic w zależności od zespołu pracowników obsługujących

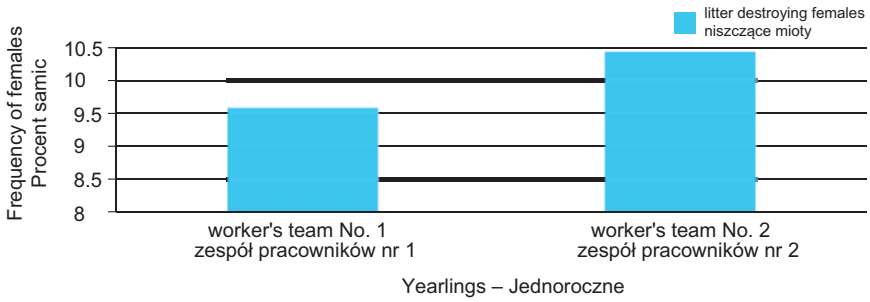


Fig. 5. Frequency of litter destroying one-year-old females by operating team
Rys. 5. Procentowy rozkład liczby niszczących mioty jednorocznych samic w zależności od zespołu pracowników obsługujących

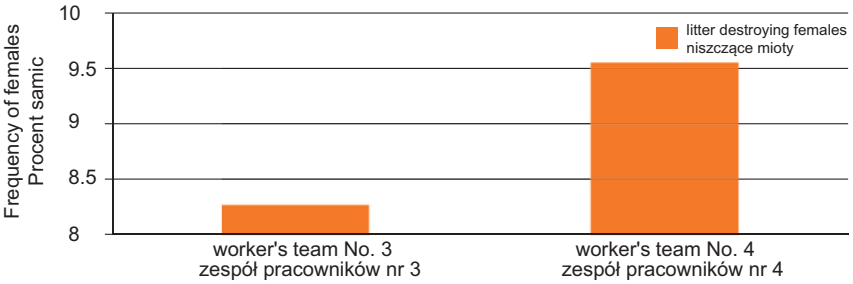


Fig. 6. Frequency of litter destroying two-year-old females by operating team
Rys. 6. Procentowy rozkład liczby niszczących mioty dwuletnich samic w zależności od zespołu pracowników obsługujących

This study reveales that the percentage of miscarying one-year-old females ranged between 3.09% and 5.14%, while in two-year-old group – between 5.12% and 5.5%, depending on the team. Similar results were reported by Lorek [1996], who indicated that the percentage of miscarrying females oscillated around 5%. Zwierzchowski [1984] and Szeleszczuk [2001], on the other hand, that the differences in the results achieved by the workers might have been due to both errors in the mating procedures and phisical traumas, but also due to stress caused by improper capturing, handling, and noise.

Within the group of litter-destroying females, this parameter was different depending on the team of keepers. Namely, it ranged between 9.57% and 10.41% in one-year-old females and between 8.27% and 9.54% in the older females. The reasons why females may kill the young were mentioned by Zwierzchowski [1984] and Szeleszczuk [2001] and included stimulation during the postpartum period, stress resulting from agalactia, poor hygienic conditions, or improper interference of the people handling the animals.

Rearing of the young was another analysed factor. According to Kuźniewicz and Filistowicz [1999], breeders negligence and leaving too numerous litters of small-weight young, which cause from 8% to as many as 12% of offspring mortality over the first two

days of postnatal life. This, however, is not the only cause of such great loss. The authors state that special diligence of the breeders is necessary to provide adequate hygienic conditions of the cages during nursing. Also Zwierzchowski [1984] reports that high young mortality may result from cold, drafty, and dirty nests, which leads to many infections. The analysis of this parameter by experimental group is presented in Figs. 7 and 8. Results achieved in the group of younger females indicate that females in the care of the team 1 of workers were characterized by the nursing success at the level of 93.5%, while females in the care of team 2 only slightly exceeded the level of 87% of rearing success (Fig. 7). Weaning percentage among older females cared of by team 3 was 92.5%, while the females of team 4 reared 90% of offspring (Fig. 8).

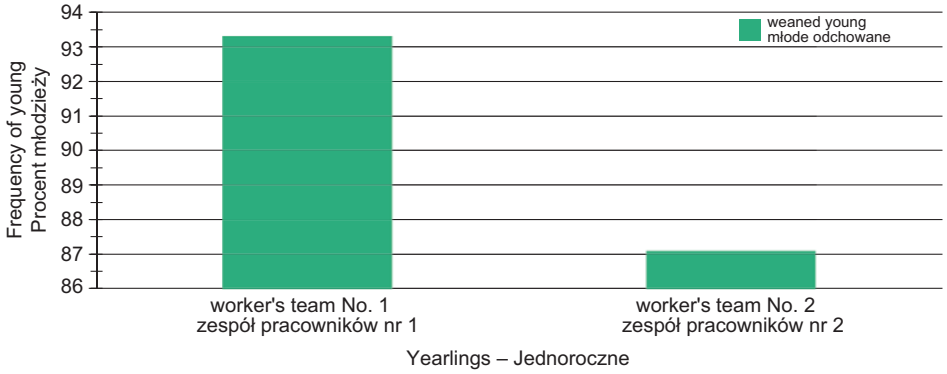


Fig. 7. Frequency of young weaned by one-year-old females by operating team
Rys. 7. Procentowy rozkład liczby młodzieży odchowanej przez samice jednoroczne w zależności od zespołu pracowników obsługujących

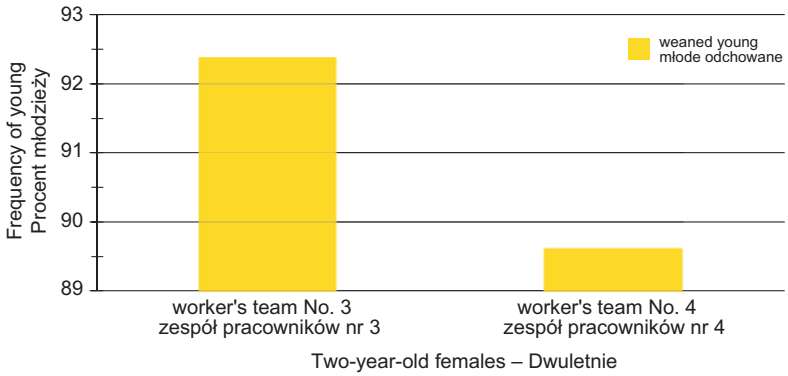
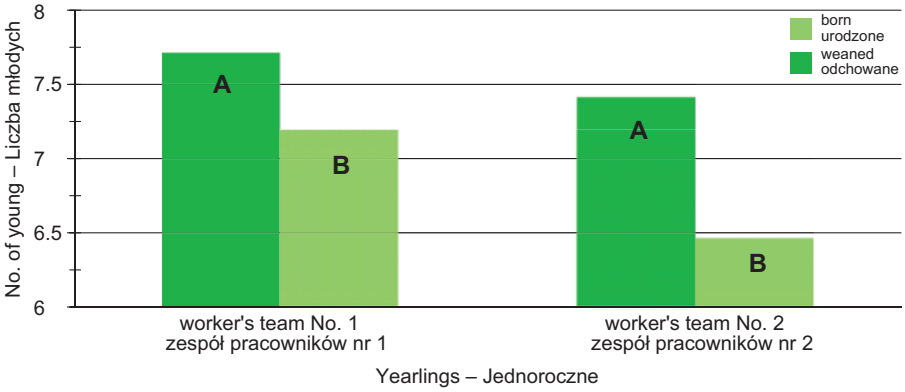


Fig. 8. Frequency of young weaned by two-year-old females by operating team
Rys. 8. Procentowy rozkład liczby młodzieży odchowanej przez samice dwuletnie w zależności od sprawującego nad nimi opiekę zespołu pracowników

Lisiecki and Sławoń [1980] point out that 80% of all losses among young mink happen during the first week of their lives. On the other hand, Kuźniewicz and Filistowicz

[1999] indicate that 20% of the loss of young at age 4–5 weeks may repeat in the absence of lactation of the mothers. However, the loss can be minimized by attentive observation of the appearance and health, and intensive feeding of females. It is known that good care should also include the dams after weaning of the young, as they can be emaciated due to intense period of nursing.

The studies also indicate the existence of differences in the average number of young born and raised by a one- or two-year-old female, depending on the care of the team of employees. Again, in the case of younger females, the team no. 1 showed a better performance, reaching significantly higher values in both the average number of born (7.71) and raised (7.41) compared to young females, which were cared of by team number 2, who obtained 7.19 and 6.46 young born and raised, respectively (Fig. 9).



The numbers marked with the same letters differ significantly at P≤0.01.
Liczby oznaczone tymi samymi literami różnią się istotnie przy P≤0,01.

Fig. 9. Mean number of born and weaned young by one-year-old females by operating team
Rys. 9. Średnia liczba urodzonych i odchowanych młodych przez samice jednoroczne w zależności od sprawującego nad nimi opiekę zespołu pracowników

Among the 2-year-old females, also differences were showed in these characteristics in favor of the employee team number 3 (7.8 young born, 7.2 raised), compared to the team number 4 (7.59 born, 6.8 raised), but in this case, the recorded differences were not significant (Fig. 10).

Deaths of the young mink in the final period of rearing is, as explained by Szeleszczuk [2001], the result of mechanical trauma, heat shock, and – above all – poor quality food. This fact was confirmed by Bis-Wencel et al. [2006], who in a group fed on the ration supplemented with an antioxidant and preservative gained an average of 0.8 more young weanlings, compared to the control group.

The results obtained in this study were higher than those reported by Święcicka [2004] for animals of the same color variety. Among younger females, this parameter was 7.23 born and 6.24 raised, while in older females 7.27 and 6.57, respectively. Similarly, Ślaska et al. [2009] gives values slightly lower than those presented here. Indeed, these authors

indicate that the average number of young born and raised in one-year-old Scanbrown females was 7.27 and 7.14, respectively, while for two-year-old females 7.66 and 7.41, respectively.

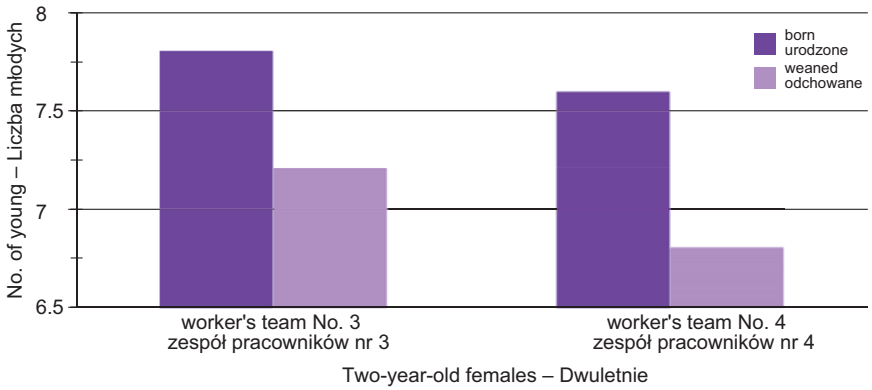


Fig. 10. Mean number of born and weaned young by two-year-old females by operating team
Rys. 10. Średnia liczba urodzonych i odchowanych młodych przez samice dwuletnie w zależności od sprawującego nad nimi opiekę zespołu pracowników

The results presented in this study undoubtedly confirm the strong influence of the proper handling of animals by the staff on the level of selected reproductive parameters achieved by the female.

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WPŁYW JAKOŚCI OBSŁUGI ZWIERZĄT NA WYBRANE PARAMETRY REPRODUKCYJNE NOREK

Streszczenie. Celem pracy było określenie, jaki wpływ na poziom wybranych parametrów rozrodczych samic norek ma właściwa obsługa zwierząt, definiowana jako tak zwany czynnik ludzki. Analizie poddano wybrane parametry rozrodu 6348 samic jednorocznych i dwuletnich odmiany scanbrown, takie jak: płodność, plenność oraz wskaźnik odchowu młodych. Norki podzielono na cztery grupy, grupę I i II stanowiły samice jednoroczne, grupę III i IV samice dwuletnie. Poszczególne grupy samic obsługiwane były przez cztery różne zespoły pracowników. Uzyskane wyniki wskazują na duży wpływ jakości obsługi zwierząt na analizowane parametry rozrodu.

Słowa kluczowe: norki, obsługa zwierząt, plenność, płodność, wskaźnik odchowu

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