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AN ATTEMPT OF EVALUATION OF THE EFFECT OF GEOPATHIC ZONES ON ASSESSMENT OF CONFORMATION IN ARCTIC FOX (*ALOPEX LAGOPUS*)

Summary. The study was an attempt to determine the effect of geopathic zones within a farm on results of conformation assessment in young Arctic foxes from weaning to slaughter. Investigations were conducted on a large Arctic fox farm on cubs of both sexes (1803 male and 1517 female) born in the years 2003-2005. The course of underground streams on the farm was established using a resonator and next marked on the farm plan. In the period of full coat ripeness conformation assessment was performed following the currently binding conformation grading standard for Arctic foxes. Based on results of conformation assessment and using the analysis of variance animals kept in geopathic zones were compared with animals from areas with no such zones. Obtained results suggest that in case of young Arctic foxes an adverse effect of geopathic zones was not recorded. Some results indicate a slight positive effect of geopathic zones on young foxes. Further more extensive studies need to be conducted concerning the effect of these zones on conformation assessment scores in older animals, kept in areas with such zones over longer periods of time.

Key words: Arctic fox, geopathic zones, coat

Introduction

Every living organism may be exposed to the action of numerous adverse environmental factors, one of which is radiation caused by underground streams (water radiation), which generates the so-called geopathic zones. These zones may cause electromagnetic anomalies, affecting animal health and productivity. Numerous studies reported their adverse effect on human and animal organisms (KUBASIEWICZ 1981, FRESHWATER 1997, SAUNDERS 2003, HACKER et AL. 2005).

Not all animal species respond to geopathic zones in similar ways and admissible rates were developed for the effect of these zones on different groups of animals (HERBUT 2005). Health disorders were observed; in young animals these were growth retardation and reduced weight gains, while in older animals they included disturbances in the sexual cycle, miscarriages and smaller sizes of litters (MOŚCICKI 1979, KRZYWDA et AL. 1981, IWAŃCZUK et AL. 1995, JANOWSKI 1995, TOMBARKIEWICZ 1995).

Animals living in the wild may move elsewhere when the environment has a negative effect on their organisms. In contrast, farm animals to a large degree are dependent on the rearing technology adopted by the breeder, which determines the possibility to change their dwelling place. In fur animal breeding, especially in case of such species as foxes, raccoon dogs or mink, animals in the foundation stock as well as reared growing animals spend most of their lives indoors (in free-standing cages and cages inside pavilions), with no possibility to select an area with no geopathic zones. This may adversely affect their health, well-being and widely understood welfare, i.e. the aspect which in recent years has been extensively investigated, especially in carnivorous fur animals. The desire to improve animal welfare is an important element of all legal acts pertaining to the development of modern agriculture (HERBUT 2005).

Scores of conformation assessment, including scores for body size and conformation, colour morph, colour purity and coat quality are reliable indications of management conditions, i.e. also animal welfare. Animals kept under poor environmental conditions (e.g. inadequate feeding, poor housing conditions: location of facilities as well as the facilities themselves) do not score high in conformation assessment.

So far there are practically no extensive studies on the effect of geopathic zones on productivity of fur animals. The aim of the study was to evaluate the effect of geopathic zones in a large area of a farm on the conformation scores of young Arctic foxes during the period from weaning to slaughter.

Material and methods

Investigations were conducted on a farm breeding Arctic foxes located in western Poland (the Wielkopolska province). The experiment was conducted on cubs of both sexes (1803 male and 1517 female) born in the years 2003-2005. Cubs were kept with their mothers in free-standing cages from birth to weaning at the age of seven weeks. After weaning cubs were transferred to pavilions. The farm has six single-row pavilions (denoted as A, B, C, D, E and F), with different numbers of cages. In the pavilions there are a total of 362 cages of identical dimensions: length 200 cm × width 120 cm × height 80 cm. Each year after weaning cubs were placed in cages in the order of successive births, starting from pavilion A, followed by B, C, D, E and F. In accordance with binding standards four foxes were housed in each cage. Young foxes (weaned cubs) stayed in pavilions on average for a period of up to 150 days, with no change of cages.

In this experiment a resonator was used, which is the simplest and easiest to operate dowsing tool. The courses of underground streams were determined on the farm and next transferred onto the prepared farm plan (Fig. 1). In order to increase the reliability of the determined location of underground streams, i.e. geopathic zones, they were localized by two independent persons authorized to localize water springs (MOŚCICKI

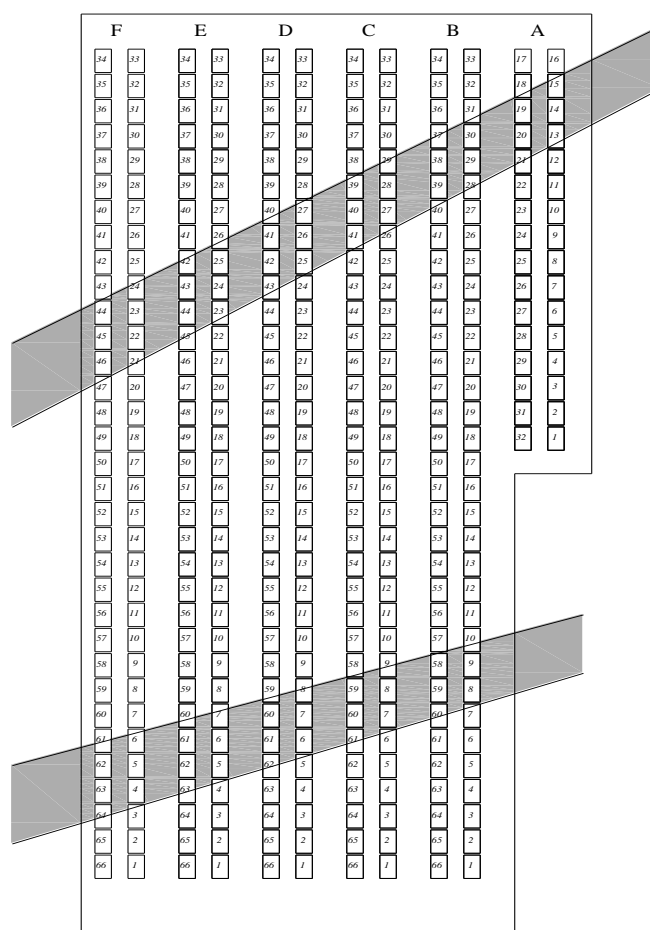


Fig. 1. Distribution of cages in pavilions A, B, C, D, E and F with marked two geopathic zones

Rys. 1. Rozmieszczenie klatek w pawilonach A, B, C, D, E i F z zaznaczonymi dwiema strefami geopatycznymi

1979). The intensity of geopathic zones may be determined using gauging devices such as e.g. a geomagnetometer (GŁOGOWSKI 1999 a, b), which due to its cost and laborious measurements is unlikely at present to be widely used in large-sized farms.

Conformation was assessed at full coat ripeness following the current grading standard for Arctic foxes (WZORZEC... 1998). The assessment included four traits: size and conformation, colour morph, coat colour purity and coat quality. Traits were given scores with the maximum total of points for all traits of 20 points.

In this study the multifactorial analysis of variance (SAS, ver. 9.1) was used to evaluate the effect of underground streams (geopathic zones) detected on the farm as well as the sex and year of birth on conformation point scores.

Results and discussion

It should be attempted in pelt production to use to the maximum all factors (genetic and environmental) resulting in improved fur value of harvested pelts. Two parameters have a decisive effect on pelt prices, i.e. pelt size and coat quality (FILISTOWICZ et AL. 1999). Conformation assessment in young animals facilitates selection towards good quality pelts. Coat in fur animals is one of the most important factors indicating the health state of animals, their nutritional state as well as management conditions. Any disturbance in environmental conditions is manifested most markedly in the coat, which most frequently indicates a disturbed or poor welfare of these animals.

Two underground streams were localized on the farm, running almost parallel under cages in the pavilions. They ran south-west to north-east (Fig. 1). It was found that a total of 82 cages were located in pavilions built within the area of impact of geopathic zones, which in relation to the total number of cages in pavilions was 22.6%. Throughout the entire analysed period 729 foxes were kept in those cages (21.95% the total number of animals). Conformation assessment scores depending on the main analysed factor, radiation of underground streams (geopathic action zones), are presented in the table.

Analysis of variance showed a significant effect of the year of birth of animals on most analyzed traits (body size and conformation, colour purity, coat quality and total score). At the same time a superior coat quality and higher total scores were recorded for dogs in relation to the corresponding data for vixens at $p \leq 0.01$ (Table 1).

The investigated factor (the geopathic action zone) differentiated conformation scores. Geopathic zones were found to have no effect on the colour morph or coat colour purity. This results probably from the considerable effect of the genetic factor on the above mentioned traits.

Coat quality of foxes kept in cages located above the geopathic zones was slightly higher, but the difference turned out to be statistically non-significant.

Scores for body size and conformation as well as total scores for general appreciation turned out to be statistically higher in the group of foxes kept in cages located in the geopathic zones. Also other studies (ZUBCZEWSKA 1998) did not confirm an adverse effect of geopathic zones on the organisms of young silver foxes. The best scores for assessment of conformation were recorded for young silver foxes kept in cages, under which a non-uniform (disturbed) magnetic field was detected.

In turn, a study by BARTKOWIAK and BARABASZ (1984) showed deteriorated reproduction results for vixens of Arctic foxes and silver foxes kept in cages located in geopathic zones. This was manifested in a deterioration of fertility indexes (by approximately 16%) and prolificacy indexes (by approximately 24%) in vixens kept within these zones in comparison to the mean results for the whole farm population. Moreover, a more frequent incidence of wastage was recorded for cubs of vixens kept in cages affected by the geopathic action, increased by approximately 3% at birth and approximately 7% in the period up to weaning, in relation to the mean wastage rates reported for the whole farm. It needs to be stressed that in the cited study the zones were determined using an analogous method as that adopted in this study.

Table 1. Conformation traits of Arctic foxes during whole investigation period (2003-2005) depending on the water veins (points)

Tabela 1. Cechy pokroju lisów polarnych w całym okresie badawczym (2003-2005) w zależności od cieków wodnych (pkt.)

Factor	n	Conformation traits				
		1	2	3	4	Σ 1-4
		LSM ±S.E.	LSM ±S.E.	LSM ±S.E.	LSM ±S.E.	LSM ±S.E.
Water vein		*	ns	ns	ns	*
Water vein	729	5.62 ±0.03	2.79 ±0.02	2.37 ±0.02	6.15 ±0.02	16.97 ±0.05
No water vein	2 591	5.54 ±0.02	2.80 ±0.01	2.36 ±0.01	6.13 ±0.01	16.84 ±0.03
Year		**	ns	**	**	**
2003	869	5.38 ±0.03 AB	2.82 ±0.02	2.10 ±0.02 AB	6.12 ±0.02 AB	16.45 ±0.05 AB
2004	1 020	5.80 ±0.03 AC	2.79 ±0.02	2.60 ±0.02 AC	6.27 ±0.02 AC	17.48 ±0.05 AC
2005	1 431	5.57 ±0.03 BC	2.78 ±0.01	2.40 ±0.02 BC	6.03 ±0.02 BC	16.78 ±0.04 BC
Sex		ns	ns	ns	**	**
Male	1 803	5.61 ±0.02	2.81 ±0.01	2.37 ±0.01	6.17 ±0.02	17.00 ±0.04
Female	1 517	5.55 ±0.03	2.79 ±0.01	2.36 ±0.01	6.11 ±0.02	16.81 ±0.04

*p ≤ 0.05.

**p ≤ 0.01.

Means signed with the same letters in line differ significantly at p ≤ 0.01.

ns – not significant.

1 – body size and conformation of animal, 2 – colour type, 3 – colour purity of hair, 4 – quality of hair.

The time vixens of Arctic and silver foxes spent in geopathic zones in a study by BARTKOWIAK and BARABASZ (1984) included the period of preparation to mating, gestation and parturition, i.e. a total of over five months. Weaned cubs are transferred to pavilions and kept in the same cage until they produce the winter coat (a period of less than five months). This varied duration of cage dwelling could have affected the observed differences in results. The electromagnetic field has the strongest effect on organisms during embryonic development and during growth (PRESMAN 1971). This is why it probably affects cubs differently than it does adult animals, such as their mothers.

Conclusions

1. No adverse effect of geopathic zones was shown in case of analysed young Arctic foxes. A slight positive effect of these zones was found on coat quality assessed on live animals at their full ripeness.

2. A different effect of underground streams on young foxes tested in the investigations conducted by the authors of this study, in comparison to data reported in literature on the subject concerning adult animals, indicates the advisability to evaluate the long-term effect of keeping animals in areas with geopathic zones.

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PRÓBA OKREŚLENIA WPLYWU STREF GEOPATYCZNYCH NA OCENĘ POKROJU LISÓW POLARNYCH (*ALOPEX LAGOPUS*)

Streszczenie. Celem pracy była próba określenia wpływu stref geopatycznych na obszarze fermy na ocenę pokroju młodych lisów polarnych w wieku od odsadzenia do uboju. Badania wykonano na dużej fermie lisów polarnych, na szczeniętach obu płci (1803 samce i 1517 samic) urodzonych w latach 2003-2005. Za pomocą rezonatora wyznaczono miejsca przebiegu na fermie podziemnych cieków wodnych, które następnie naniesiono na schemat fermy. W okresie pełnej dojrzałości okrywy włosowej oceniono pokrój zgodnie z aktualnie obowiązującym wzorcem oceny pokroju lisów polarnych. Na podstawie wyników oceny pokroju, wykorzystując analizę wariancji, porównano zwierzęta przebywające w strefach geopatycznych ze zwierzętami z terenu bez tych

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stref. Otrzymane wyniki wskazują, że w przypadku młodych lisów polarnych nie zaznaczył się niekorzystny wpływ stref geopatycznych. Niektóre wyniki świadczą o niewielkim pozytywnym wpływie stref geopatycznych na młode lisy. Należałoby przeprowadzić szersze badania związane z wpływem tych stref na ocenę pokroju zwierząt starszych, dłużej przebywających na terenach, gdzie takie strefy występują.

Słowa kluczowe: lis polarny, strefy geopatyczne, okrywa włosowa

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