

Use and breeding of livestock guarding dogs in the Subcarpathian area

Joanna Kania-Gierdziewicz, Barbara Mroszczyk

*University of Agriculture in Krakow, Department of Genetics and Animal Breeding,
al. Mickiewicza 24/28, 30-059 Kraków, Poland; rzkania@cyf-kr.edu.pl*

The dog remains one of the most beloved companion animals accompanying the man and meeting his need of companionship or play with a live animal, especially in children and elderly. Since domestication of the dog probably over 14,000 years ago, more than 400 breeds have been developed, which differ often widely in many morphological traits (e.g. size, body weight) and functional features, depending on work they were bred to do (Fogle, 2008). Dogs trained to be therapy or assistance dogs for handicapped or other working dogs (used by rescue and civil services) do their job eagerly and sometimes perform many responsible tasks. In this way they can help the men or replace men's work, e.g. as guard dogs, livestock guarding dogs, herding dogs, retrieving game for hunters or saving people's life. However, a majority of dogs is owned or bred as companion animals for their enjoyable look and being affectionate towards their owners. In a vast majority of cases, breeding of such species is based on commitment of fans of certain breeds which carry out breeding selection at homes or backyards basing usually on several or even single animals. Such breeding endeavors are coordinated by *Federation Cynologique Internationale* (FCI) that is World Canine Organization, and in Poland by The Polish Kennel Club, which is a member of FCI. At present, often some breeds of working dogs, e.g. livestock guarding dogs are used as companion dogs although, due to their specific features resulting from the original purpose they were bred for, they are not quite fit to play this new role, especially in urban apartment houses,

and can cause some problems to their owners (Drożdż, 2014).

According to the commonly accepted criterion FCI divided all dog breeds into four categories: working dogs, livestock guarding dogs, retrievers and companion dogs (Fogle, 2008). According to specific function, livestock guarding dogs were further classified into herding dogs which help to control and keep a flock or herd in one location, and guardian dogs, which specialize in protecting livestock from predators, most often bears, wolves and lynxes (Śmietana, 2006). Livestock guarding dogs fulfill a very important function on farms, which cannot be replaced either by human's work or any machine. Dog's exceptionally acute senses and inborn instinct are perfect for working with flocks of sheep or goats and herds of cattle or even horses. However, each such dog requires individual approach to the care and training (Śmietana, 2006). In Poland, there are places where livestock guarding dogs' popularity still survived and they can fulfill tasks matching their inherited skills. Especially, the southern range of the Subcarpathian region (foothills and mountains) is such location where livestock guarding dogs still help farmers in managing flocks of sheep and herds of other animals (Śmietana, 2000, 2005; Nowak & in., 2005; Lescureux et al., 2014).

According to Czudec et al. (2013), the Subcarpathian region is among less economically developed regions of Poland where a greater percentage of population than in other regions of Poland live in rural communities (more than 58%).

Agriculture is usually of extensive type with smallholder farms (to 5 hectares). Livestock breeding is small-scale, farmers raise cattle (including dairy cows), horses, pigs and poultry, sheep farming is based on grazing especially in foothill areas (Bieszczady, Lesko, Sanok and Lubaczow Districts). In 2010 most of sheep farms were located in the Bieszczady and Lesko Districts and especially in the municipalities: Komańcza, Lutowska, Cisna, Czarna, Olszanica, Krempna, Lesko, Ustrzyki Dolne and Lubaczów.

Sheep farms in these municipalities reared also the largest flocks (from 30 to almost 100 head). The Subcarpathian region is also known of terrific recreational and tourist attractions and outstanding natural landscape features due to diversity of the terrain (highlands, foothills and mountains). About 48% of its area is protected by different environmental protection programs. In 1973, the Bieszczady National Park, one of bigger national parks in Poland, was established in this area encompassing a large part of the Bieszczady Mountains. It belongs to a UNESCO Biosphere Reserve (Czudec, 2013).

In recent years, protection of livestock flocks and herds grazing in the mountains and foothills from attacks of predators, like wolves, bears and lynxes came to be of great importance not only in Poland but also in the whole Europe due to increasing population of wolves and its migration to the west of Europe. The extent of damage caused by these predators and magnitude of compensations granted have been also discussed. Similar problems were encountered by breeders and environmentalists from North America and Africa.

These issues have been widely discussed by researchers engaged in environmental protection research from many countries (Ribeiro & Petrucci-Fonseca, 2004; Rigg, 2005; Hansen, 2005; Landry et al., 2005; Levin, 2005; Reinhardt et al., 2012; Álvarez & Blanco, 2014; Mettler, 2014; Landry et al., 2014; Lescureux et al., 2014; Salvatori, 2014), also from Poland (Okarma et al., 1998; Śmietana, 2000, 2005; Nowak & Mysłajek, 2005; Nowak et al., 2005), and even from North America and Africa (Marker et al., 2005; Bangs et al., 2005).

The need for the use of livestock guarding dogs on farms with livestock grazing on

foothill or mountain areas has been highlighted, with regard to Poland (including the Subcarpathian region) by Nowak et al. (2005), Nowak & Mysłajek (2005), and also Śmietana (2006), recently, also in Germany as reported by Reinhardt et al. (2012) and in other European countries as described by Álvarez & Blanco (2014), Mettler (2014), Landry et al. (2014) and Lescureux et al. (2014). According to the review published by Nowak et al. (2005) evaluating damage caused by wolves, in the period 1991–2000 thirteen Tatra Shepherd dog pups were given to farmers raising small ruminants in the Subcarpathian region and another 12 pups were donated to 10 farmers of different livestock species (sheep, goat, cattle and horses) in the Żywiec and Silesian Beskids. These projects aimed to test efficiency of livestock guarding dogs in flock or herd protection. All these pups were appropriately trained and have proved their worth.

However, there are no studies to date which would address the problem of the numbers and breeds of livestock guarding dogs used and bred in foothill and mountain regions of Poland. Therefore, the aim of the present study was to analyze the prevalence, and raising and breeding conditions of livestock guarding dog (LGD) breeds in the Subcarpathian Voivodeship, with special attention paid to the foothill and mountain areas of the Bieszczady Mountains as natural pastures for sheep grazing protected by livestock guarding dogs and herding dogs and to determine which breed was preferred by LGD breeders and farmers.

Material and methods

The studies were conducted at 16 farms in the southern range of the Subcarpathian Voivodeship (Bieszczady, Lesko and Sanok Districts) which utilized working dogs and 8 licensed breeders of LGD. Data regarding the number of animals, their sex, work assignment and training methods were collected and analyzed.

In addition, an attempt was made to analyze husbandry methods, i.e. housing, feeding and breeding of working guardian dogs and kennel guardian dogs. Data were collected using specially prepared questionnaires and personal reviews with owners at their farms.

The questionnaire for dog owners contained 11 questions and for breeders 10 questions regarding besides the above-mentioned issues, also feeding and care for animals, breeding, if applicable, dog's specific characteristics, origin (farms) and customer preferences (kennels). The questionnaires are presented in Annex 1 and 2.

Reviews were performed in the form of unstructured talks with farmers, who willingly shared their knowledge and long experience with raising and training their dogs. Reviews also included personal observations of dogs' behavior during working on the farm, and interaction with other animals and people, feeding and housing conditions.

Results and Discussion

In the Subcarpathian region, three breeds of working dogs can be the most commonly encountered: Border Collie, Bernese Mountain Dog and Tatra Shepherd Dog. They were classified into different groups: working dogs and livestock guarding dogs. In terms of body size, two of these breeds, namely Bernese Mountain Dog and Tatra Shepherd Dog were included into the group of large dogs while Border Collie into medium-size dogs. Bernese Mountain Dog which is a guardian-herding dog was categorized into II FCI group II while Tatra Shepherd Dog and Border Collie into group I that includes livestock guarding dogs (<http://www.zkwp.pl>).

Table 1. Number of examined farms in different localities of Subcarpathian voivodeship

Locality	No. of farms	Breed	No. of dogs	Sex	
				males	females
Wańkowa	1	Tatra Shepherd dog	3	2	1
Rajskie	2	Tatra Shepherd dog, mongrels	6	4	2
Lutowiska	1	mongrels	1	0	1
Wetlina	2	Tatra Shepherd dog	3	2	1
Krywe	1	mongrels	2	1	1
Smolnik	2	Border Collie	1	1	0
Brzegi Górne	1	Tatra Shepherd dog	1	0	1
Oslawica	1	mongrels	1	1	0
Bacówka n. Mała Rawka	1	Tatra Shepherd dog	1	0	1
Chmiel	1	Border Collie	1	1	0
Żłobek	1	mongrels	1	0	1
Rabe (Bieszczady District)	1	mongrels	1	0	1
Rabe (Lesko District)	1	mongrels	1	0	1

As reported by Czudec (2013) and Czudec et al. (2013), 776 sheep farms operated in the Subcarpathian region in 2010 r. The largest percentage of sheep farms amounting to 11.34%, (i.e. ca. 88 farms) was noted in the Bieszczady and Lesko Districts. However, according of data published by the Statistical Office in Rzeszów for years 2010–2016, in the last years, the number of organic farms which include operations engaged in sheep breeding and grazing has been gradually decreasing due to its low profitability and risk of damage caused by large predators in the mountain areas.

Table 1 presents the number of farms under analysis in different Subcarpathian localities. In a majority of cases, there were single farms in each locality, except for the villages Rajskie, Wetlina and Smolnik, where two farms were located in each. In total, in the Bieszczady, Lesko and Sanok Districts, 16 farms utilizing purebred or mixed-breed livestock guarding dogs trained to do such job were subjected to analysis (18% of the total number of sheep farms recorded in this area in 2010).

In total, 23 dogs (12 bitches and 11 dogs) were kept in the operations under study which gave on average 1.44 animals per farm.

As can be seen in Tab. 1, mixed-breed dogs trained to fulfill guardian function prevailed in the study group (8 farms). As reported by the owners, they are decidedly cheaper solution than purebred dogs. These dogs work best with small flocks. The Tatra Shepherd Dog proved to be the most often chosen breed (6 farms) and Border Collie was the second (3 farms). On two farms (in the locality Rajskie) Tatra Shepherd Dogs and mixed-breed dogs were kept together. No representatives of Bernese Mountain Dog were noted. Farmers showed no preferences as to dog sex, so almost equal numbers of bitches and dogs were recorded.

Table 2 presents the number of kennels in different localities with breeds, total number of animals and numbers of bitches and dogs. A total of 8 kennels were investigated, that raised together 25 animals (5 dogs and 20 bitches), thus, it is 3.13 animals per kennel on average.

Table 2. Number of licensed kennels in different localities of Subcarpathian voivodeship

Locality	No. of kennels	Breed	No. of animals	Sex	
				dogs	bitches
Rzeszów	2	Bernese Mountain dog	9	2	7
Krosno	1	Tatra Shepherd dog	4	1	3
Ostrów	1	Tatra Shepherd dog	1	0	1
Bażanówka	1	Bernese Mountain dog	2	1	1
Łęki Górne	1	Bernese Mountain dog	2	0	2
Dębica	1	Tatra Shepherd dog	1	0	1
Iwonicz	1	Border Collie	6	1	5

Most of licensed breeders of livestock guarding dogs were located near larger towns (Krosno, Rzeszów, Dębica). Usually, a single kennel was situated in a given locality, two kennels were found only in the surroundings of the city of Rzeszów. Among breeders from the Subcarpathian region, Bernese Mountain Dogs (4 kennels) and Tatra Shepherd Dog (3 kennels) enjoyed the greatest popularity (Tab. 2).

It is interesting to compare preferences of farmers owning working dogs and breeders of livestock guarding dogs. While the owners definitely preferred the native breed (44% of study farms) the breeders decidedly promoted foreign breeds (63% of kennels). Thus, farmers using livestock guarding dogs could potentially have problems with purchase of the breed they require.

Training of a dog is quite a long process involving socializing and preliminary training and then gradually increasing exercise intensity after the dog reaches one year of age. Apart from habituating the dog the owner and his family and to other dogs, livestock guarding dogs have to be habituated to the flock of ruminants which they are going to guard and work with. Thus, they usually live close to, i.e. within the pen or room where guarded animals are kept. It is important especially for pups, which have to be habituated from the beginning to animals of different species learning from their mother how to work with the flock (Rigg, 2005; Śmietana, 2006; Biziorek, 2012). Questionnaires collected from farmers utilizing working dogs suggested that if the dogs were trained at all, it was mostly done by the owners (more than 56% farms) without assistance of professional trainers. Dogs were not trained only on three farms and on their own had to better or worse cope with their work. Comparison of situation of the localities listed in Tab. 1 and 2 shows that certified kennels of livestock guarding dogs were located quite far away from sheep farms, i.e. their potential customers. The kennels were usually located near bigger towns and did not breed other animals than dogs which made proper training practically impossible.

On the study farms, dogs were bred only for own use (over 68% farms) and in this way farmers had litters from the preferred and already well checked bitch of a given breed or mixed-breed. We were unable to obtain reliable information regarding litter size and fate after

weaning but indirectly based on discussions with farmers, it can be assumed that farmers willingly exchanged pups among themselves or sold them to their neighbors from the same locality. Livestock guarding dog users preferred to obtain dogs from known unregistered kennels, also from abroad (Slovakia, Czech Republic, Ukraine) or even more often from known sources i.e. from fellow farmers, than from certified kennels. Farmers did not purchase dogs from certified breeders mostly because of high prices of those animals and lack of time for searching an appropriate kennel in which purebred LGD dogs would be preliminarily trained to perform tasks required by the customer (Śmietana, 2006).

No information on litter size and numbers was also obtained from breeders. Bred dogs were usually taught daily routines and were socialized and habituated everyday life. Although these were dogs of livestock guarding breeds, they received no guardian training, which resulted from other objectives of the breeders and lack of other animals (e.g. sheep, goats or cattle) in these operations. Those dogs were raised and bred more in view of shows than real work with the flock. However, dogs of breeds possessing guardian or herding instinct (especially Border Collie), which is expressed already from 6th week of age, even if not used for sheep herding can show possessive features manifested by constant herding attempts towards animals and people which can cause problems for future owners and can be a cause of conflicts in dog-human interactions (Drożdż, 2014). Such practices in certified kennels practically excluded their dogs from real use as livestock guarding dogs. Similar observations were made by Ściesiński et al. (2009) with regard to Tatra Shepherd Dog kennels in the Podhale region. They possessed farms raising cattle, horses or even sheep and could train the dogs, unfortunately, they did not do that, it is a pity, because it could be an additional source of income for the breeder. The reason of such practices is probably related to the fact that working trial is not required by the breed standard of Tatra Shepherd Dog (<http://www.zkwp.pl>). In our opinion, such regulation has an adverse effect on the breed which was originally assumed to be livestock guarding breed. Similar rule applies to breed standard of the Bernese Mountain Dog but, interestingly, according to breed standard of Border

Collie, for these dogs working trial is mandatory (<http://www.zkwp.pl>).

According to opinions on many experts, livestock guarding dogs to be able to be of invaluable help in sheep grazing should be appropriately fed, should have access to drinking water and shelter protecting them from harsh atmospheric conditions (Śmietana, 2005; Rigg, 2005; Mettler, 2014). Analysis of questionnaires and reviews demonstrated that on a majority of farms, dogs were fed a mixed diet, i.e. homemade food with appropriate supplements to balance animal's diet. On farms in Lutowska and Rabe (Bieszczady District), dogs were fed noodles with meat, in Krywe additionally with groats, in Wańkowa dogs were fed a vegetarian diet and in Brzegi Górne the BARE diet (Biologically Appropriate Raw Food) composed only of raw components (meat, vegetables). Thus feeding practices differed widely between dog owners depending on their knowledge. Feeding of dogs was not entirely proper on all farms. Bearing in mind that these were working dogs, especially a vegetarian diet for dogs raises reasonable doubts.

All farm dogs had constant access to pure drinking water which was a very positive sign because earlier there was a tendency that this very important aspect for animal welfare was neglected. Farm dogs were not overwhelmed by work and willingly and eagerly performed their routine tasks and were obedient to the owner.

Like on farms, also in kennels, feeding of dogs was an individual choice of the breeder and depended on his resources. Feeding of purebred dogs was mostly based on specialized feeds containing all necessary nutrients in appropriate proportions and composed to fit requirements of each dog breed and age. Breeders believed that these feeds were on much help to them assuring proper feeding of dogs. In kennels in Rzeszów and Bażanówka dogs were additionally given homemade food. Thus, feeding of dogs in kennels was more appropriate in terms of diet composition than on farms, nevertheless, when the animals did not work they should be provided with other forms of exercise to avoid overweight. In kennels, this problem was solved by letting dogs stay in a backyard for most of the day and occasionally walking them outside.

The questionnaires also suggested that livestock guarding dogs used for working were

groomed only when necessary and grooming was limited to removing dirt from coat. According to Larkin (2003) it is not difficult to groom livestock guarding dogs. They require only basic grooming procedures i.e. brushing with special tools to prevent tangling. Kennel dogs were groomed more often because they participated in dog shows which required more effort to keep their coat properly cared for (Ściesiński, 1998).

Discussions with farmers confirmed an increased need to protect farms in the Bieszczady Mountains from raising wolf population and thus an increasing demand for such dogs as Tatra Shepherd Dog.

Recapitulation and conclusions

It can be concluded that in the Subcarpathian region, there were twice as many farms utilizing livestock guarding dogs as kennels breeding these dogs but both these operations kept a comparable number of animals. In kennel, bitches outnumbered dogs while on farms owners did not have preferences as to dog sex, thus, more or less there were as many bitches as dogs.

Breed was not the most important factor influencing the choice of working dog on farms in the southern Subcarpathian range. A half of farms raised usually mixed breed dogs which can be considered to be disadvantageous for LGD breeding. Nevertheless, farmers preferred Tatra Shepherd Dog which are still believed to be the best dogs for protection of household and flock from large predators occurring in the Bieszczady Mountains.

Comparison of farmers owning working dogs and breeders of livestock guarding dogs showed that the former preferred the native breed while the latter favored foreign breeds. It can cause potential problems for farmers with purchasing a working dog of the breed of their choice.

Kennels of livestock guarding dogs in the Subcarpathian region were relatively scanty considering a large area of this voivodeship and predicted increase in demand for these breeds. These kennels were located far away from sheep farms, therefore, they provided dogs mostly for people looking for companion, guard, breeding or show/sporting dogs.

Owners of working LGDs preferred either raising pups from their own bitch or purchasing dogs from „reliable sources”, i.e. from

fellow farmers who also bred own dogs (not necessarily purebred). They did not use dogs from licensed breeders due to high prices of offered dogs which did not receive preliminary training in working with the flock.

The studies showed that feeding and handling methods largely depended on individual preferences of the owner. In bigger kennels, dogs were fed only commercially available feeds which was not used or much less used on farms because of costs. Feeding of dogs in kennels better satisfied dogs' needs than feed provided on sheep farms.

Owners of working dogs mostly trained their dogs themselves whereas livestock guarding dogs in kennels were only socialized with people because kennels did not train dogs for guarding or herding of flocks due to the lack of possibilities (they usually were not engaged in livestock husbandry).

Therefore, it appears that there is a large discrepancy between objectives of breeders of livestock guarding dogs and requirements of potential users of these breeds. It is caused, among other things, by the fact that only for one third of the studied breeds (Border Collie) working trial is obligatory, while in our opinion such trials should be mandatory for all three examined breeds. Therefore, it can be concluded that the only way to encourage breeders to train their dogs for guarding livestock, it would be to change the relevant provision in the breed standards, especially for Tatra Shepherd Dog and Bernese Mountain Dog. It would also be helpful for meeting expectations of potential LGD users. Additional positive aspects of such change will include an opportunity for some breeders to develop a new form of profitable economic activity and possibility to promote the native breed.

Annex 1

Questionnaire (kennels)

1. Where is the kennel located?
2. How many dogs do you keep?
3. Dog characteristics:
 - a) Breed:
 - b) Age:
 - c) Sex:
4. How many litters and of how many pups do you have annually?
5. Are the dogs subjected to working trial?
6. Are the dogs preliminarily trained before selling?
7. Are the dogs fed special feeds and are there any dietary requirements?
8. Do you have any information about whether your dogs are more often purchased as working or companion dogs?
9. Do the dogs show some specific characteristics (e.g. a good guardian)?
10. Did you possess some other livestock guarding dog breeds in the past?
 - a) No
 - b) Yes
 - Which breeds:

Questionnaire (farms)

1. Where is your farm located?
2. How many livestock guarding dogs do you have?
3. Dog characteristics:
 - a) Breed:
 - b) Age:
 - c) Sex:
4. What is origin of the dogs (from which kennel)?
5. Are they working dogs (how do they work)?
6. How many hours a day?
7. Were the dogs trained?
 - a) No
 - b) Training at home
 - c) Professional trainer
8. Are the dogs fed special feeds and are there any dietary requirements?
9. Were the dogs bred (how many litters of how many pups)?
10. Do the dogs show any special characteristics (e.g. a good guardian)?
11. Did you possess some other livestock guarding dog breeds in the past?
 - a) No
 - b) Yes
 - Which breeds:

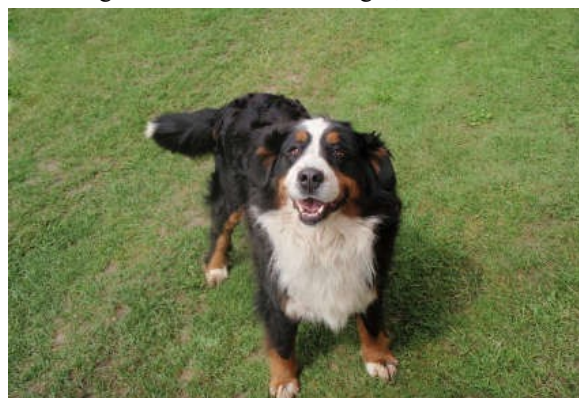
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Border Collie



Bernese Mountain dog



Tatra Shepherd dog

Phot. Internet

USE AND BREEDING OF LIVESTOCK GUARDING DOGS IN THE SUBCARPATHIAN AREA

Summary

The aim of the work was to present the description of farms using livestock guarding dogs and kennels of these dog breeds in the area of the Subcarpathian Voivodeship. The study focused on three of the most typical breeds divided into guarding dogs (Tatra Shepherd dog, Bernese Mountain dog) and herding dogs (Border Collie). The surveys addressed to breeders and farmers who owned working dogs were used in the research. It can be seen from the results that livestock guarding dogs have always been faithful helpers, assisting in grazing animals. Their instinct and intelligence can be certainly relied upon. These dogs are popular not only as working dogs but also as companion dogs due to their temperament. However, most of the kennels moved to towns despite the fact that the dogs of the examined breeds need much exercise and are therefore easier to keep in the country. On the other hand, sheep breeders who own livestock guarding dogs rely on their colleagues and on their, not necessarily purebred, dogs rather than on registered kennels, so they often breed their dogs on their own. In the area of Bieszczady Mountains the number of big predators, threatening the safety of sheep flocks, is still growing. Some ways to manage this problem are more efficient than others, but the method of its complete elimination has not yet been found. Using livestock guarding dogs (in this case mainly of Tatra Shepherd dogs) is one of the best ways of defending the herds from wolves and bears.

Keywords: livestock guarding dogs, kennels, farms, Bieszczady Mountains, Subcarpathian voivodeship