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APPLICATION OF MODERN TECHNOLOGIES IN DAIRY PRODUCTION-SUPPORTING AGRICULTURAL FARMS IN ZAMBRÓW COMMUNITY

ZASTOSOWANIE NOWOCZESNYCH TECHNOLOGII W GOSPODARSTWACH ROLNYCH WSPIERAJĄCYCH PRODUKCJĘ MLEKA W GMINIE ZAMBRÓW

Summary: Dairy cattle breeding is one of the crucial sectors of agricultural production in Poland. Its main aim is to reach a high yield and quality of raw milk under the conditions of a given farm. Implementation of modern production-supporting technologies, including the systems of control of health and welfare of farm animals allows obtaining the milk with high quality parameters. The annual milk production in Poland is equal to 11.6 billion tons what constitutes ca. 8.5% of the total EU production and ranks Poland among the leading producers of the European Union. In Poland, there are about 711 thousand agricultural farms which keep the cattle; it is estimated that ca. 30–35% of labour force resources in agriculture are connected with the milk production [21]. The present paper shows the results of survey studies, carried out among the inhabitants of Zambrów community, with the aim of evaluating the degree of utilization of modern technologies in agricultural farms.

Keywords: dairy cattle management, milk production, milk production automatization, herd management systems

Streszczenie: Chów bydła mlecznego stanowi jeden z kluczowych działów produkcji rolniczej w Polsce. Jego głównym celem jest osiągnięcie wysokiej wydajności i jakości surowca w warunkach danego gospodarstwa. Uzyskanie mleka o wysokich parametrach jakościowych umożliwia wdrażanie nowoczesnych technologii wspierających produkcję, w tym systemów kontroli zdrowia i dobrostanu zwierząt. Roczna produkcja mleka w Polsce wynosi około 11,6 mln ton, co stanowi około 8,5% całkowitej produkcji Unii Europejskiej i plasuje kraj wśród jej czołowych producentów. W Polsce funkcjonuje około 711 tys. gospodarstw rolnych utrzymujących bydło, a szacunkowo od 30 do 35% zasobów siły roboczej w rolnictwie związanych jest z produkcją mleka [21]. W niniejszym artykule przedstawiono wyniki badań ankietowych przeprowadzonych wśród mieszkańców gminy Zambrów w celu oceny stopnia wykorzystania nowoczesnych technologii w gospodarstwach rolnych.

Słowa kluczowe: chów bydła mlecznego, produkcja mleka, automatyzacja produkcji mleka, systemy zarządzania stadem

Introduction

The obtained quantity of milk is dependent on the herd size and unitary performance which is dependent on the economic level of a farm. Great disintegration of farms and, in consequence, small production scale makes obtaining of high profitability and stable functioning on dairy market impossible. Due to these reasons, the attention is more and more often paid to the factors, responsible for taste and dietetic values of milk and its products, i.e. nutrition, maintenance and animal genotype. At present, food is perceived not only as a source of nutritional constituents (nutrients) indispensable for human organism's functioning but we are also interested in health-promoting properties of milk [7, 19, 11].

Technological progress allows automatization of agricultural farms and reduction of labour force input, with the simultaneous improvement of animal welfare [1, 11]. Introduction of modern equipment is aimed at facilitation of work, and, at the same time, ensures the best conditions for keeping the herd. We should look at each investment in a reasonable way when analyzing whether the introduced mechanisms will be favorable for animals and will not differ from the effect of activity, as being assumed by the producer [1].

Cattle management system in farm is classified with consideration of such elements as management system, feeding method and the way of keeping the animals. The mentioned systems in connection with the modern technologies affect the welfare of the animals kept in the farm. Dairy cattle management

is conducted in the farm building due to the fact that it requires milking procedure and feeding the cattle with the appropriately balanced feed [10]. Nowadays, we make many efforts in order to keep the animal welfare via ensuring the optimal conditions in cow barns (microbiological aspects as well as equipment). In dairy production, there are applied different systems of cattle management, milking, feeding methods and manure removal [2]. The choice of the appropriate cattle management system which is a criterion of obtaining the satisfactory results in keeping of dairy cattle, is a very important problem. When introducing the selected system solutions, we should consider their consequences and other aspects, including:

- Scale and concentration of production;
- Investment outlays;
- Size and composition of technological groups;
- Practical shaping of the space of boxes and buildings; and
- Defects and advantages of indoor and open system [19, 18].

A free-stall system is intended for keeping of the greater cattle herds. The barns which are properly arranged and utilized, satisfy the requirements of animal welfare very well. The accommodation where the animals are found in the mentioned case, is divided into the living areas (including those intended for rest and for feeding) and milking parlor [17].

The system of keeping the cows and microclimate have the effect on maintaining of the dairy cows in the welfare which is specified as a physiological state of living organism, free from discomfort, ensuring the conditions in which the animals are not hungry and thirsty and do not feel the discomfort and, also are free from diseases, distress and fear [15]. Fertility is also the important matter as good reproduction results in the case of high animal concentration and increase of dairy performance of cows are decisive for the profitability of total breeding. The fertility traits are usually characterized by a low heritability, therefore, nutrition, age of the first calving and animal conditions have a big influence on their variability. [8]. We should remember that the increase of performance is also favourable for incidence of metabolic diseases (ketosis and acidosis, inter alia). The results of the studies conducted in Poland indicate the deteriorating fertility, connected with a high milk yield [12]. The studies of Sawa and Maciejewski [2000] show that culling due to fertility and disturbances in reproduction system functioning becomes the main reason for removal of cows from the herd.

The care treatments have a meaningful effect on obtaining a high and satisfactory milk production, also in respect of obtaining good-quality milk. The duty of employing the animal care procedures is imposed by the Act on animal protection (Art. 27) in accordance with the requirements of welfare and health of farm animals [1997]. The hoof trimming is intended to eliminate the health problems of legs in the dairy cattle breeding, which result from the increase of hoof horn. The correction of hooves is a meaningful, although often neglected treatment. It is a procedure consisting in trimming and aligning of hooves and removal of loose horn; it is important because it allows avoiding many health problems in cows, especially leg diseases which affect:

- Reduction of cow productivity down to 36%;
- Prolongation of calving interval even by 76 days;
- Lowering of fertilization efficiency during the first mating, ovarian cysts;
- By three times higher index of insemination repetitions per one pregnancy;
- High culling index; and
- Loss of the place in herd's hierarchy.

The mentioned treatments include also care of skin and dairy cow udders via cleaning and brushing what improves blood circulation, removes dead epidermis, dust, sweat, parasites and another contamination; all this causes improvement of animal health state. The skin of the cows should be cleaned possibly often, using a special brush and beginning from the neck, via withers and back, chest, sides and belly, ending at legs and rump.

Cleaning of udders before every milking, using water and soap or a special liquid is a very important procedure for the cow health. The wiping cloth intended for the mentioned purpose, should be washed and boiled every day but it is better to employ single-use towels. If the udders are clean, they should be dry-wiped from dust. Cleaning of the udders contributes to reduction of bacterial count. Before commencing milking, a massage of teats is performed, using the circular movements in order to increase the oxytocin level in the udder. After ending the massage, the milking may be commenced. Once in Poland, the milking was manually performed, via knuckling which consists in grasping the teats base between thumb and forefinger and squeezing then the successive fingers on the test what causes milk extraction.

At present, milking is most frequently performed mechanically and is commenced from the attachment of the teat cups on the teats after activation of vacuum. It is important to remember that the teat cups cannot suck the air and cannot touch the litter. The beginning of the after-milking process is manifested by the decline in the milk quantity which flows through the pipeline or collector. The mentioned technique consists in charging the milk collector down with one hand to prevent the rise up of the teat cups on almost empty udder. We may conduct post-milking massage using the second hand.

Cow nutrition is a very important element, affecting the milk production and yield of cows in the farm. The requirement of cows on feed is dependent on the changes occurring in production cycle. During the initial stage of lactation, the increase of productivity is dependent on the genetic conditions and at the peak of lactation it is mainly dependent on cow nutrition and management conditions.

The initial stage of lactation when the mentioned performance is quickly increased, the feed is not able to cover the requirements of nutrients as during the discussed period, feed intake is not high. To cover the energy deficits, the cows take the reserves from fat of the body what causes a decline of their body weight. The mentioned reserves are recovered during the middle lactation period (maximum up to 2 months). The energy which a cow is able to utilize from the received

roughages and concentrates is lower than the amount which results from the sum of the feed units of the particular feeds.

The requirements of the dairy cows for nutrients should be compensated adequately to the changes in demand, resulting from the production cycle of the cow; owing to this it is possible to avoid the metabolic disturbances. During the first lactation period, the cows should be fed the same feeds which were administered during the period, preceding the calving. The rate of the feed should be gradually increased until obtaining the ration, indispensable for coverage of energy requirements for the assumed maximum milk production in the peak lactation period. In the middle stage of lactation, milk production is lowered and cow restores her body reserves. During the mentioned period, feed ration should cover the demand of cow, depending on the level of milk production and the needs resulting from the body weight recovery [14].

During drying-off period, the cows should not be fed intensively as not to overfat the liver because it may cause the metabolic disturbances after calving. In a final stage of in-calf period, the intake of roughage by cow is decreased, therefore, the addition of concentrates should be employed [3].

When choosing the appropriate equipment for milk production, we should consider, inter alia, the management system, size of the herd, cow performance or system of milk receipt. In the tying-stall system, the can milking machines are nowadays employed where milk is collected in the cans and then, is transferred to a cooling device. In turn, the pipeline milking machines transport milk to the coolers via pipelines [4].

In the case of can milking machines, the cost of their purchase is low, similarly as the cost of their functioning and assembling. The defect of the discussed milking system consists in the necessity of transporting the cans to the coolers. Such milking system is also less hygienic. When considering the defects, the mentioned milking machine is recommended in the farms, keeping up to 30 dairy cows. The pipeline milking machines eliminate the problem connected with the milk transportation to the cooler and their installation requires some changes in the barn but their functioning is somewhat more expensive as compared to can milking machines. The pipeline milking machines do not also ensure the complete hygiene as they aspirate the air from the milking parlor and when working under a high vacuum, they cause its variations under the teats; it contributes to mastitis incidence rate. The mentioned milking machines are recommended in the herds, amounting to 30–100 cows [9].

In the case of free-stall cowhouses, milking is carried out in the milking parlors which may be equipped with different quantity of standings. In respect of configuration of the stands, we may distinguish different types of milking parlors, i.e.: herringbone, tandem, milking in parallel or carousel arrangement (rotary milking parlor). The choice of milking parlor and as being consistent with the requirements of the producers contributes to more effective milking, being not longer than 1.5 h because the time of waiting of the cows should not be longer.

The milk coolers are also very meaningful element of milk production. When making the choice, we have to consider the frequency of milk receipt; quite often, the milk is received every

day but there are also the farms where the milk is received each another day; in connection with this fact, it is better to have the cooler for the milk coming from four milkings. Very seldom, the milk is received after each milking, or more rarely than each two days. The coolers are equipped with the cooling aggregates and their power and time of cooling are dependent on the quantity of the milk to be chilled.

At present, the open or closed directly cooled tanks are dominating on the market. The closed coolers are not equipped with the cover but only a control opening and in connection with this fact, they possess a washing part. Nowadays, it is recommended to employ plate heat exchanges what allows a quick lowering of temperature. Additionally, the milk being cooled down by the described method and transported to the storage tank, does not increase the temperature of the already present milk therein.

The feed intake devices are a very important equipment in the farms. In TMR nutrition system, the feed wagons are employed; they should be so chosen as to administrate the total 24-hour feed ration at once [6]. In small and medium-size herds (50–70 animals) feed wagon is chosen with the consideration of a single-time preparation and administration of feed for the whole herd, without division into feed groups. The application of the mentioned nutrition technology and utilization of the feed wagon makes the service of animals more efficient and reduces the time necessary for conducting the described operation. Such way of feed administration affects also the animal welfare because the animals do not experience the stress, connected with waiting for feeds [14].

Milk production may be also improved owing to computerized feed stations which are intended for automatic nutrition of cows and calves with concentrates. The cows are furnished with the electronic transponders which facilitate their identification owing to a reader of feed station. The quantity of the administered feed is dependent on the dairy performance of dairy cow what allows measuring the feed quantity, being individually tailored to a given animal. The work of the system is managed by the program which is installed in the farmer's computer; he may check whether the whole administered feed ration was consumed by the cow. Feed station reduces time consumption, necessary for the mentioned operation [14].

Methodology of the studies

The main purpose of the conducted studies was to evaluate the application of modern technologies in the milk production-oriented agricultural farms on the grounds of the survey studies. In order to collect the necessary information, the survey tests in a form of on-line questionnaires were carried out in among the inhabitants of Zambrów community.

To this end, there was developed a questionnaire, consisting of 20 questions, with the closed and semi-open scale where the respondents had the possibility of choosing few answers from the suggested ones. To ensure the transparency, the collected information – after statistical and mathematical analysis (*inter*

alia, single-componential ANOVA and other variance tests, carried out in STATISTICA program) was illustrated by the descriptive and graphical method.

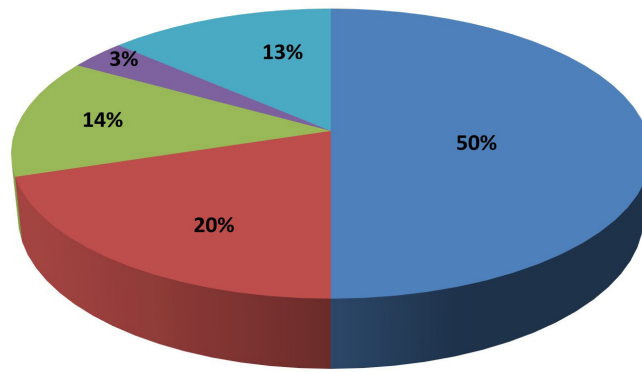
Own studies

The studies conducted for the needs of the present paper were participated by 30 owners of milk production-oriented agricultural farms. From among the tested persons, there were 4 women what constituted 13% of the respondents and 26 men (87% of the respondents). The persons at the age of 25 years were dominating; they constituted a half of all participants. It may be, perhaps, connected with the fact that survey studies were conducted in on-line form. 20% of the respondents were the persons at the age of 26–35 years. The smallest group was found in the age interval of 46–55 years (3%). The detailed description is given in Fig. 1.

The tested persons had mainly the secondary education (53%). The respondents with higher education constituted 30%, i.e. 9 persons declared possessing of such education; the lowest percentage included the respondents with vocational education (17%). From among the respondents there were no persons with the secondary (gymnasium) and elementary education what is illustrated in Fig. 2.

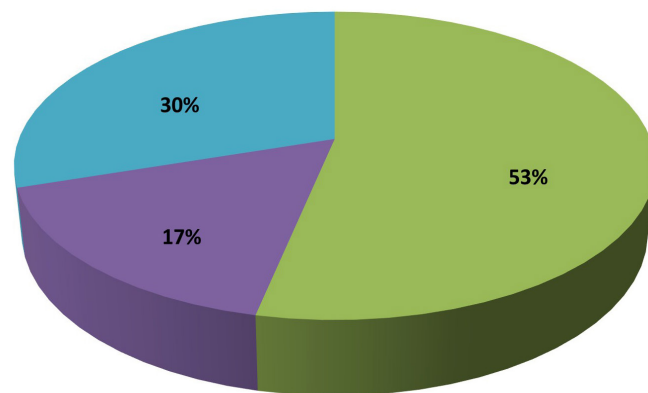
A decisive majority of the respondents (40%) i.e. 12 persons were the inhabitants of the countryside with the number of the residents below 100 persons. 20% of the respondents came from the village above 100 inhabitants. The smallest group of the respondents was constituted by the inhabitants from the villages having above 200 persons (only 7%) (Fig. 3).

The studies revealed that 33% of the respondents had farms greater than 11ha and smaller than 25ha. In turn, 30% of the tested persons had



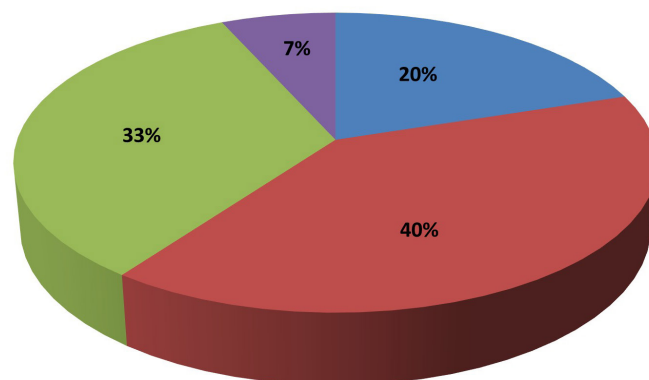
■ Up to 25 years ■ 26-35 years ■ 36-45 years ■ 46-55 years ■ Above 55 years

Fig. 1. Age of the respondents [own elaboration]



■ Elementary ■ Gymnasium ■ Secondary ■ Vocational ■ Higher

Fig. 2. Education of the respondents [own elaboration]



■ Village, below 50 inhabitants ■ Village, below 100 inhabitants
 ■ Village, above 100 inhabitants ■ Village, above 200 inhabitants

Fig. 3. Place of residence of the respondents [own elaboration]

the farm with area of 26–35 ha. The farms with area of 36–45 ha were owned by 20% respondents i.e. 6 persons. Only 17% of the respondents possessed the greatest farms with area above 45 ha. Nobody from the respondents had a farm smaller than 11ha (Fig. 4).

The conducted studies have revealed that the analyzed farms are quite well mechanized. Every farmer has a cultivator. Almost each farm (96.7%) is furnished with swathing machine, plough and harrows. Mowing machine is found in 93.3% of farms. More than ¾ of them is equipped with barrel cistern (76.7%) and trailer with a low power (80%). More than half of the tested farms has pressing device (66.7%), bale wrapper (63.3%), and trailer with a high power (66.7%). Silos are constructed in

11 farms, i.e. in 37% of all examined sites. Combine-harvesters are found in 1/3 of the tested farms. In 23% of the farms, feed wagons are installed. Chopping machines (straw cutters) are owned by 20% of the respondents and only 17% of farmers have loading equipment (Fig. 5).

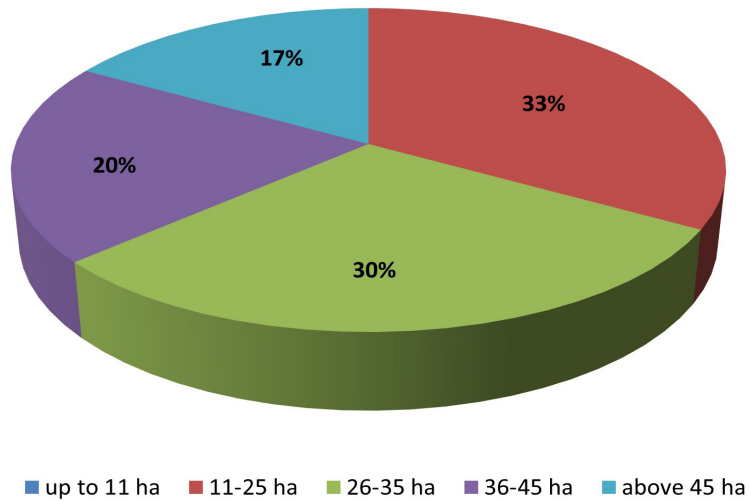


Fig. 4. Area of the possessed farm [own elaboration]

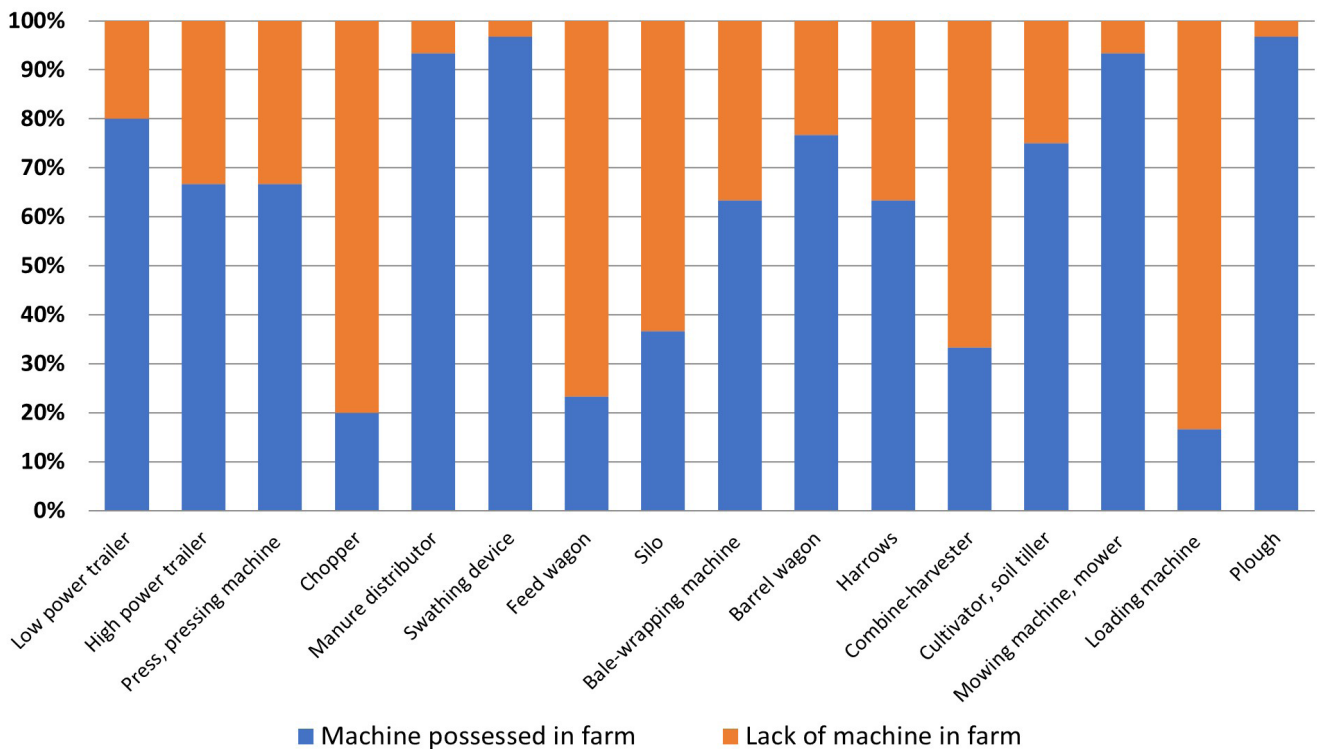
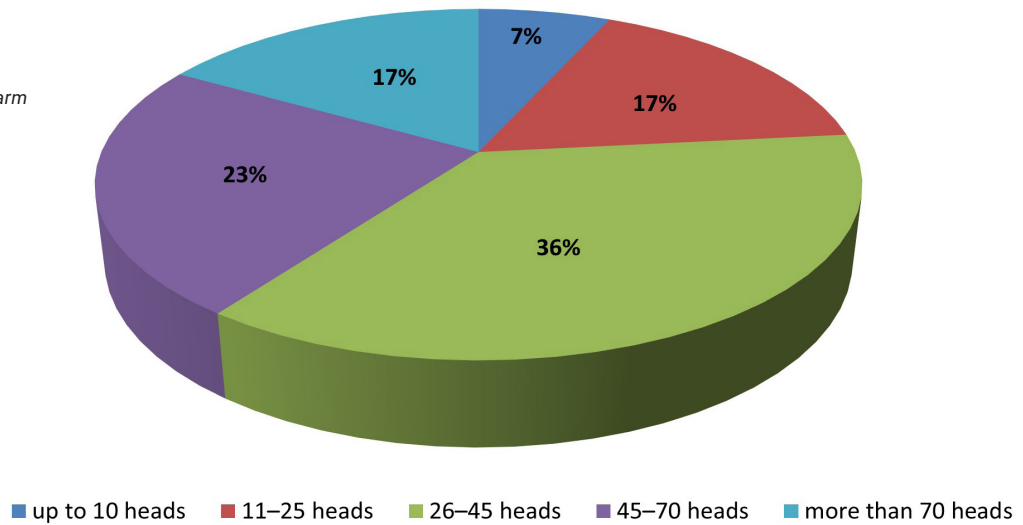


Fig. 5. The possessed equipment in the tested farms (machines) [own elaboration]

Fig. 6. The number of cattle in farm [own elaboration]



In 36% of farms, their owners keep 26-45 cattle heads; somewhat less, i.e. 23% have 45-70 animals. The herds accounting for 11-25 heads of cattle and those with more than 70 animals constitute 17% each of the total number of the analyzed farms (Fig. 6)

More than a half of the tested farms (57%) is oriented to dairy cattle breeding whereas the remaining farmers declare mixed breeding. There are no persons who are producers of beef cattle (Fig. 7).

In 36% of the tested farms, the number of stands amounts to 24-45, i.e. it is equal to the number of cattle being managed by the mentioned percentage of the respondents. The farms which have 46-70 standings in the cow barn constitute 27%, so it means that such number of the stands is owned by 4% more farmers in comparison to those who have the same cattle number. It may be concluded that they may increase, at any moment, their breeding herd up to 70 animals. 7% of the respondents have the standings for maximum 10 animals and they declare the ownership of such cattle number. 17% of the farmers have declared that they breed more than 70 animals; such number of stands is declared only by 13% of the respondents (Fig. 8)

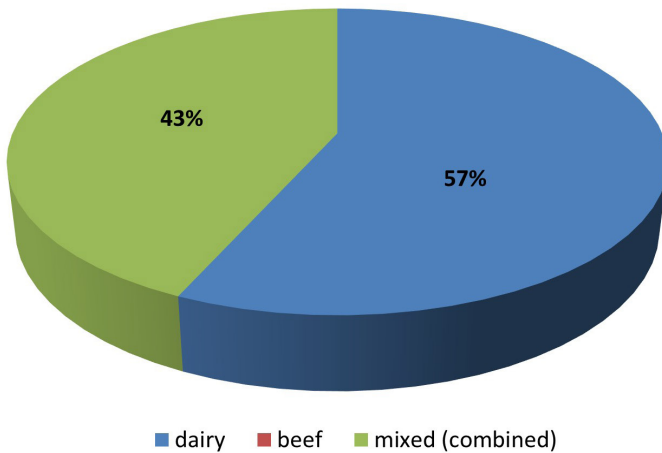


Fig. 7. Orientation of cattle breeding [own elaboration]

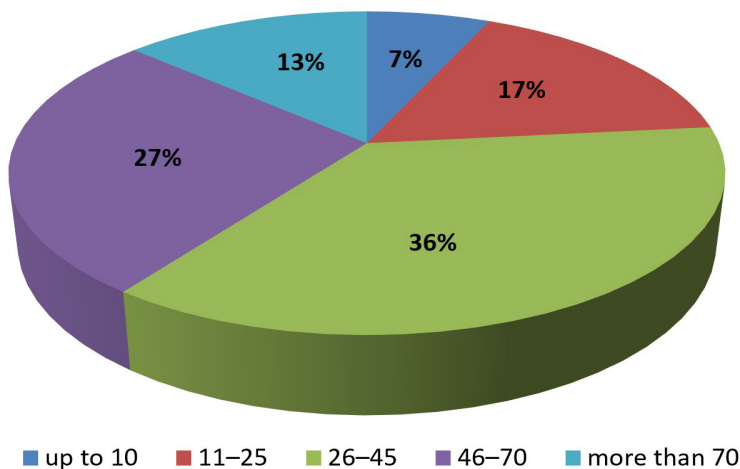


Fig. 8. The number of standings in the cow barn [own elaboration]

The conducted studies have revealed that 77% of the surveyed farmers keeps the cattle in tying-stall system and the remaining 23% – in loose housing system (Fig. 9).

More than a half of the farmers (57%) keep the animals on a shallow litter and 33% of the breeders keep the animals on a slatted floor. In the case of 10% of the tested respondents, the animals are kept on a deep litter (Fig. 10).

The conducted studies have revealed that all of the examined farms are furnished with the milking machines and equipment for milk refrigeration. Nowadays, running dairy production when managing more than 10 cows is practically impossible without the mentioned equipment.

The surveyed farms employ mainly pipeline milking machines (42%) whereas 35% of them use still can milking machines. 19% of the farms possess milking parlor but only 4% of them utilize milking robot (Fig. 11).

A half of the respondents has calf shed, 40% of the farmers rear the calves in calving pens and 10% of the surveyed persons employ cold rearing in the calf huts (Fig. 12).

In 70% of the studied farms, their owners feed the cattle traditionally whereas the remaining 30% employ TMR system (Fig. 13).

The answers to the questions concerning milk performance of the bred cows have showed that in 33% of the analysed farms, the dairy performance varies within the limits of 3500–6000 and 6000–7000 kg of milk. On the other hand, 17% of the examined farmers have declared that the milk yield of their cows is equal to more than 8000 kg of milk annually. The lowest number of farms (7%) declares that the herd reaches milk performance below 3500 kg (Fig. 14).

The studies have demonstrated that 70% of the examined farmers have the plans connected with the purchase of machines or equipment.

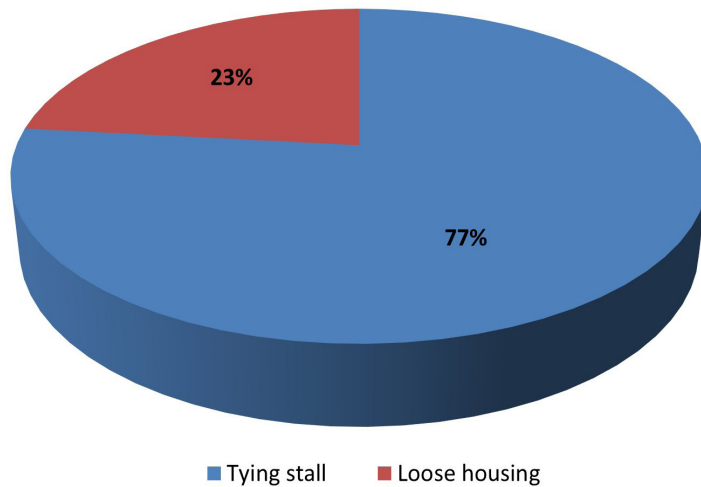


Fig. 9. The system of cattle management in the examined farms [own elaboration]

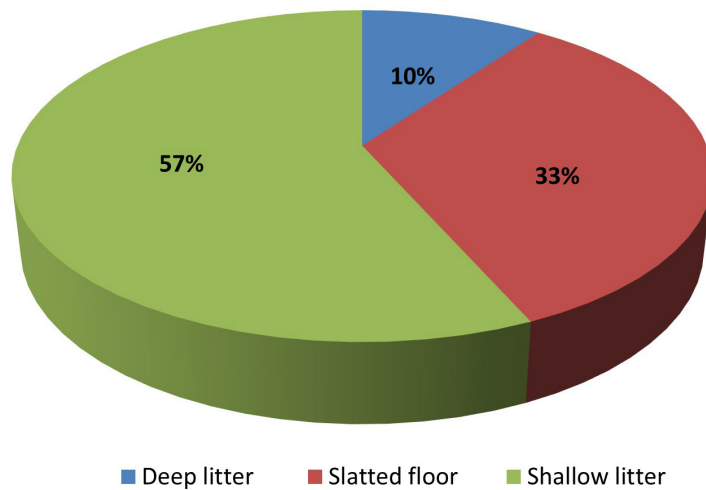


Fig. 10. The animal keeping system in the examined farms [own elaboration]

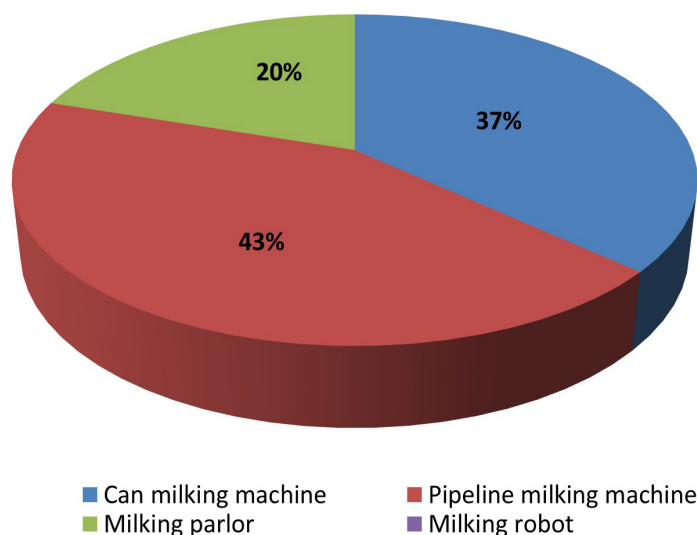


Fig. 11. Milking system of type of milking parlor in the examined farm [own elaboration]

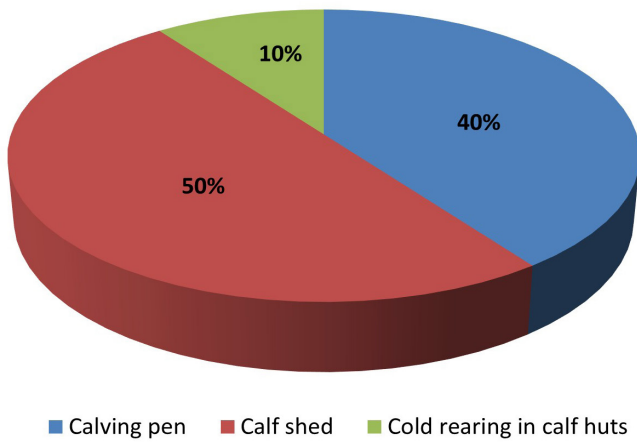


Fig. 12. System of calf rearing in the examined farms [own elaboration]

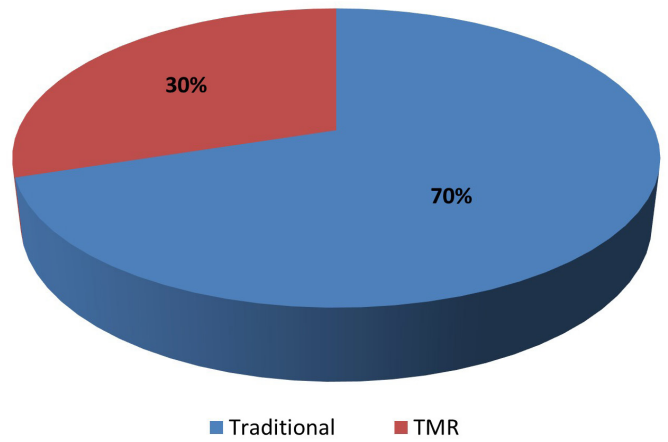


Fig. 13. System of cattle nutrition in the examined farms [own elaboration]

Fig. 14. Cow milk performance in the tested farms [own elaboration]

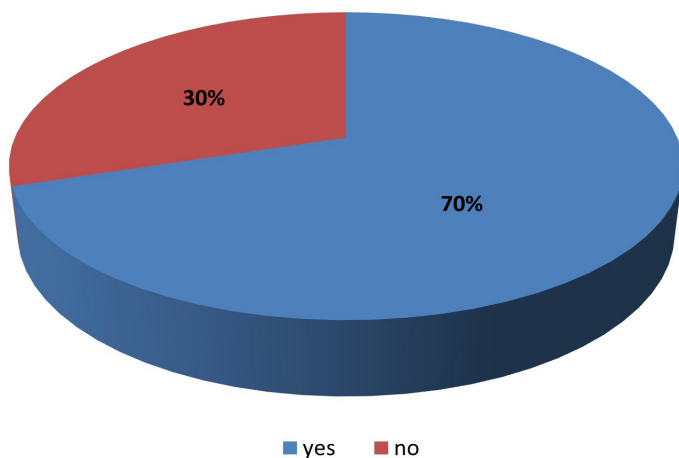
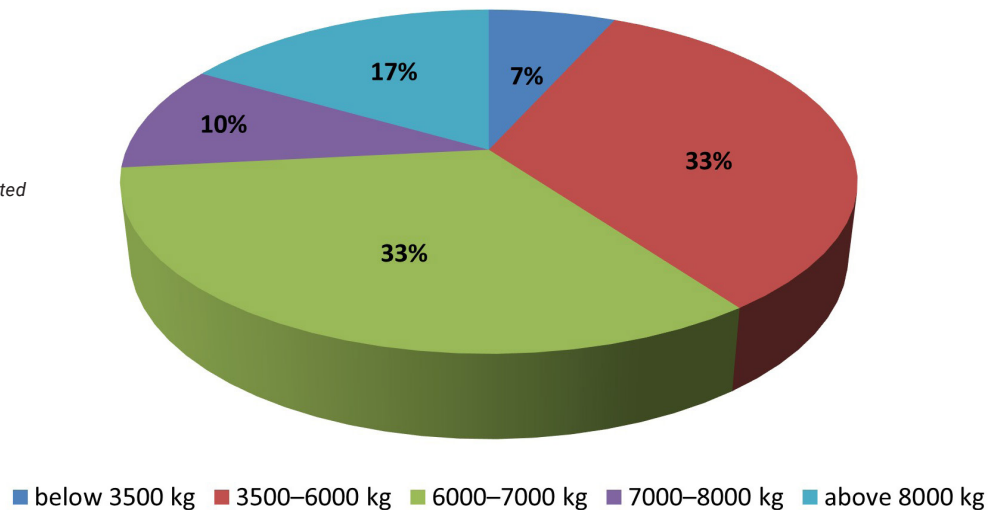


Fig. 15. Plans of purchasing machines or equipment [own elaboration]

The remaining respondents do not see such need (Fig. 15). The planned purchase included, *inter alia*:

- Trailer with power of 150 KM;
- Barrel wagon, with capacity of 16 thousand litres;
- Self-collecting, bale-stacking trailer;
- Bale-forming press machine;
- Wrapper for bales
- Pipeline milking machine;
- Cultivating (tilling) aggregate;
- Cereal combine-harvester and
- Feed wagons.

In respect of the plans connected with the development of dairy cattle breeding, 60% of the examined farmers have such plans and the remaining 40% do not see such need (Fig. 16). One of the respondents declared that he is going to increase his breeding herd as much as by 150 heads; one person intends also to enlarge his herd by 70 animals. The remaining examined farmers, revealing the intention to increase their breeding potential, do not anticipate

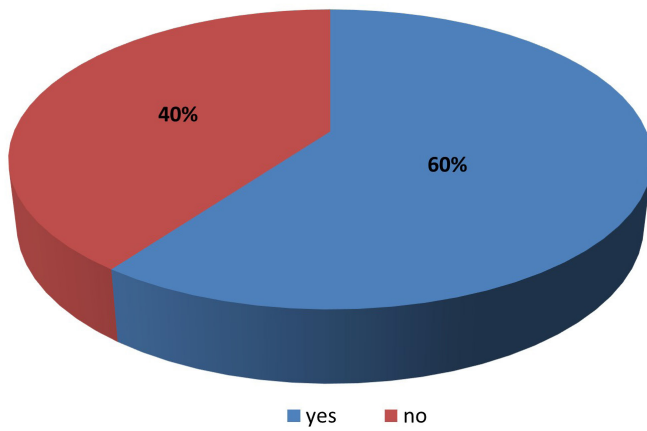


Fig. 16. Plans to increase the number of dairy cows [own elaboration]

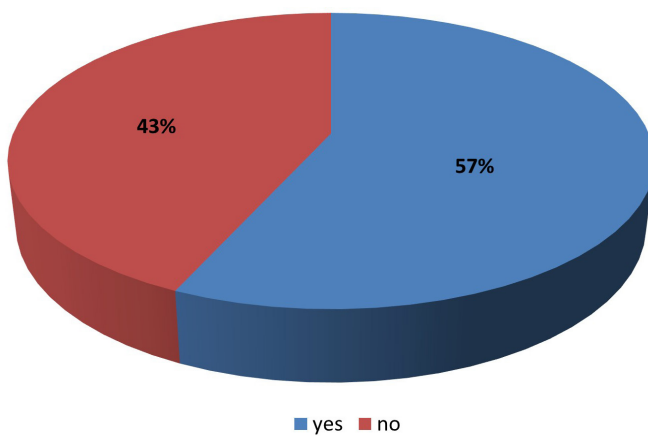


Fig. 17. Declarations concerning development of farm [own elaboration]

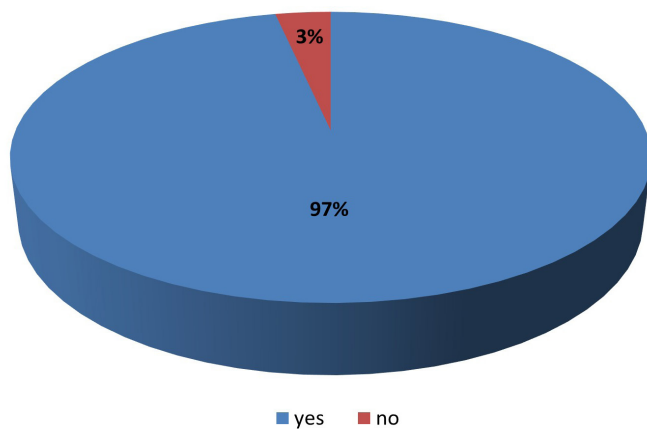


Fig. 18. Taking the benefits from the use of direct payments to milk production [own elaboration]

such big changes: one respondent plans to enlarge the herd by 20 cows and two other farmers want to buy 20 animals. Three respondents plan to have 15 milked cows more, two farmers want to buy 10 animals and 2 examined respondents intend to increase their herds by 5 cows.

The respondents were also asked to declare their intentions aimed at development of their farms and the plans connected with the construction of new buildings. 57% of the examined farmers have such investment plans (Fig. 17).

Practically, all respondents take an advantage of the European Union support. Only 3% of the respondents do not receive direct payments to milk production.

Discussion

The purpose of the dairy cattle breeding in each specialized farm is to obtain the possible highest milk performance, with the minimum labour outlays. To reach the mentioned aim, the owners of the herd should make the efforts to make milk production more efficient; it is facilitated owing to the application of new technologies.

In the case of greater cattle herd, Wójcik and Przedpełski [2010] recommend the management of the animals in free-stall system where the cows may move and satisfy their herd needs. The conducted studies have revealed that in 36% of the examined farms, their owners keep 26–45 heads of cattle and 23% have 45–70 dairy cows. The herds consisting of 11–25 animals and those with more than 70 heads constitute 17% each from the total number of the analysed farms. As it was shown in the studies, the herds are not very numerous in majority of farms; in connection with this fact, as much as 77% of the farmers keep the animals in tying stall system and the remaining 23% employ the most modern loose housing system of management (they are the farms keeping more than 70 cattle heads and those ones where the number of animals varies in the interval of 45–70 heads).

In accordance with the opinion of Grodzki [2003] and the earlier cited authors, the system of animal management in the farm is a very important issue in dairy cattle breeding. Once, the leading system consisted in keeping the cows on a deep litter. Manure was removed from the barn twice a year what resulted from the frequency of its exporting on the fields. Today, the mentioned system is rather seldom met (mainly in the case of older farmers who do not invest in their farms). At present, the farmers choose more frequently the litterless management system. The conducted studies confirm the thesis of the authors of the present paper as the deep litter was declared only by 10% of the respondents. 33% of the farmers keep the animals on a slatted floor and 57 of them employ a shallow littering. The mentioned results are the evidence of more and more frequent application of modern systems.

In their publication, Dobkowski and Staśkiewicz [2008] stated that optimum number of standings in the cow barn had a great effect on improvement of milk production in the farm. The examined farmers are aware of it as the number of standings in their farms corresponds to the number of kept animals, or even is higher (what enables development of breeding without the necessity of enlarging the cowshed). 57% of the farmers want to develop their farms.

The system of animal nutrition is a very meaningful factor, affecting the milk production and dairy cow performance. As it

Literature

was given by Homanowski [2008], cow nutrition in TMR system is favourable for a high productivity of dairy cows; it allows the reasonable feeding the animals with concentrates and roughages. On the other hand, Łuczak [2009] recognizes that feed ration in the traditional system does not possess the uniform structure and due to this fact, its administration takes place without a specialistic equipment. In connection with it, the traditional system is labour- and time-consuming. According to the opinion of the mentioned author of publication, the cited roughages and concentrates should be administrated three times a day owing to which the cows have the constant access to feeds. The conducted studies have revealed that in 70% of the farms the feed is given in the traditional way.

According to the opinion, contained in the publications of the authors such as Szlachta [2005], Malaga-Tobola [2012], the modern cattle breeding is based on the appropriately chosen milk production equipment, with the consideration of management system, herd size, cow milk yield and, also, frequency and system of milk receipt. The conducted studies have revealed that all the analysed farms are furnished with the equipment intended for machine milking and milk cooling down.

According to Dobkowski, Staśkiewicz [2008], milking of cows kept in tying stall barns is carried out using can milking machines and pipeline milking machines and in free-stall cow houses, there are employed milking parlors and milking robots. The conducted studies have revealed that the farms use mainly pipeline milking machines (43%) whereas 35% of them still utilize can milking machines. Milking parlor is owned by 19% of farms but at this moment, only 4% employ milking robot. The mentioned results are consistent with the thesis of the authors as the free-stall cow barns are possessed by 23 of the respondents.

The question concerning milk yield of the managed cows has revealed that in 33% of the analysed farms the milk performance varies within the limits of 3500–6000 and 6000–7000 kg of milk. On the other hand, 17% of the respondents declared that the yield of their cows is higher than 8000 kg of milk annually. The smallest part (7%) of the farmers declares that the herd reaches the milk yield below 3500 kg. The submitted results are the evidence of profitability of the dairy cattle breeding in the examined farms.

As it was demonstrated in the conducted studies, almost all farmers take an advantage of the direct payments to milk production from the European Union funds. As it was shown in the surveys, 57% of the respondents have the plans connected with the development of their farms, and 60% of the farmers want to increase the number of dairy cows in their herds; the greater group (70%) anticipates investment plans concerning the purchase of new machines, including *inter alia*: high-powered trailer, barrel wagon with a big capacity, self-collecting trailer, bale-forming pressing machine, bale-wrapper, pipeline milking machine, cultivation (tilling) aggregate, cereal combine-harvester and feed wagons. The obtained results of the studies in this respect are the proof of the fact that the majority of the examined farmers has the investment plans, connected with the conducted farm. The respondents want to modernize and increase their farms and, consequently, furnish them in the newer and newer technologies.

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