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UZBEKISTAN: REPORT on ENQUIRIES PROMOTED by BUzNet PROJECT to VETERINARIANS, TEACHERS of VETERINARY SCHOOLS, MILK SECTOR OPERATORS, FARMERS and VETERINARY STUDENTS

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BUzNet – WP1

INTRODUCTION

In the framework of the BUzNet project, financed by the European Union, one of the initial objectives was to have a clear view of the current situation of all the stakeholders in the veterinary and zootechnical fields in Uzbekistan. For this purpose, a series of different enquiries were produced by the project team (see in annexe) and then distributed among the target populations in the different areas in Uzbekistan where the project was implemented. The results obtained were processed and studied and the final results are presented in this report. The description of the results follows the strategy adopted in the enquiries analysing each one of the groups separately. A total of 389 respondents were obtained, of which 45 were veterinarians, 84 teachers, 94 students, 82 milk sector personnel and 84 farmers.

VETERINARIANS

Geographical areas of work - Most of the interviewees came from the Andijan and Samarkand geographical areas, with a percentage of roughly 47% and 24%, respectively. Production animal farming clearly represents the respondents' main supporting activity (91%), although some differences were noted in the number of dairy farms each veterinarian has as clients (Figure 1).

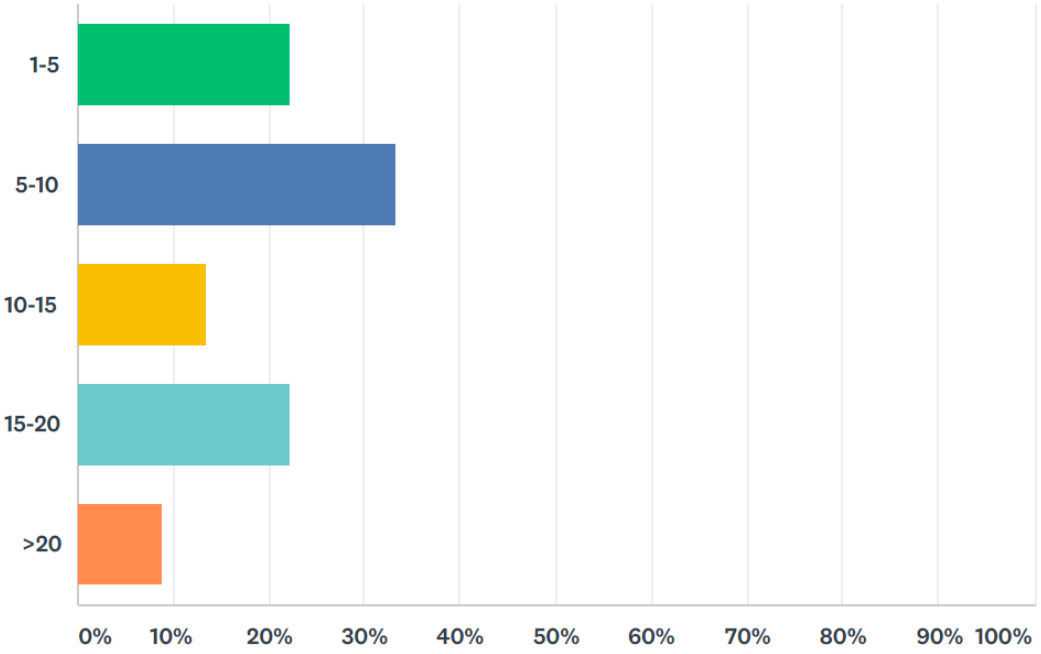

Figure 1. Number of clients (dairy farms) per veterinarian

Farm size and number - 33% of veterinarians have 5-10 farm clients, while only 9% have more than 20 farms. If we group together the first 4 categories of large animal veterinary clients, 55% of farmers have no more than 10 cows. It must be pointed out that the vast majority of farms, which are family-run businesses (67.67%) employing between 2-5 people (54.55%), house, on average, 50-100 cows (42.22%) each.
Cattle housing - the most common system is tethered housing, in 55.56% of cases, followed by loose housing and mixed housing, with percentages of 35.56% and 8.89% respectively. It should be noted, however, that in the case of heifers, individual stalls (48.89%) and group pens (40%) were more common, whereas only 11.11% used a mixed housing system.

Ventilation systems, flooring and lighting on the farms' premises - 49% of veterinarians claimed that passive ventilation systems, such as windows or openings in the wall or ceiling, were widespread in use, and only a small percentage of farms (6.67%) reported high ammonia concentrations due to poor ventilation. Concrete flooring was most widely-used, in 50% of farms visited, followed by sand and straw bedding systems. Furthermore, in 88.89% of cases respondents claimed that there was enough space for all of the cows present on the farm. With regard to the lighting system in use, the majority of farms had adequate natural lighting (61.36%), with only 18.18% of farms suffering from poor lighting conditions.

Reproductive management - When asked at which stage bovine pregnancy was usually diagnosed, veterinarians provided different responses, although the average number of days necessary for the detection of pregnancy was 60 in 44% of cases. In a few cases, pregnancy could not be diagnosed prior to six months following the artificial insemination date. With regard to the techniques in place for heat detection, results are summarized in Table n. 1.

	NEVER HEARD ABOUT / БУ ҲАҚИДА ЭШИТМАГАНМАН	I KNOW ABOUT IT, BUT NEVER USED IT YET/ БУ ҲАҚИДА БИЛАМАН ДЕКИН УМУМАН ИШЛАТМАГАНМАН	USED IN THE PAST / АВВАЛЛАРИ ИШЛАТИЛГАН	USED BUT NOT ON ALL COWS/ ИШЛАТИЛГАН ЛЕКИН БАРЧА СИГИРЛАРДА ЭМАС	USED ROUTINELY ON ALL COWS/ НАВБАТИ БИЛАН БАРЧА СИГИРЛАРГА ИШЛАТИЛГАН	TOTAL
Watching cows / сигирларни кузатиш	30.95% 13	23.81% 10	4.76% 2	23.81% 10	16.67% 7	42
Using vasectomized steers / васектомия қилинган буқалардан фойдаланиш	17.50% 7	40.00% 16	22.50% 9	7.50% 3	12.50% 5	40
Using androgenized heifers / Андрогенланган гуножинлардан фойдаланиш	34.88% 15	25.58% 11	25.58% 11	13.95% 6	0.00% 0	43
Kamar patches/ Камар ямалари	36.59% 15	19.51% 8	14.63% 6	14.63% 6	14.63% 6	41
Heat patches / Иссиқ ямалари	23.68% 9	31.58% 12	23.68% 9	13.16% 5	7.89% 3	38
Pedometers / Педометрлар	33.33% 12	19.44% 7	13.89% 5	13.89% 5	19.44% 7	36
Activometers / Активометрлар	37.84% 14	35.14% 13	5.41% 2	10.81% 4	10.81% 4	37

Table 1. Techniques used for heat detection

Although similar percentages could be observed across the different techniques used routinely, the use of pedometers was slightly higher (19% of the cases) followed by cattle observation (17%) and the use of Kamar patches (15%). It should be noted that the use of androgenized heifers was 0% (unlike in the past). Among these heat detection techniques, respondents were aware of vasectomized steers in 40% of the cases, activometers (35%) and heat patches (32%) although none of them had ever used any of these techniques. Finally, as regards the techniques the interviewees had never heard about, similar percentages were found for activometers and heat patches (38% and 37%, respectively). With regard to this, it should also be stressed that the percentage of cows for which a second artificial insemination was necessary to become pregnant was 10-20% in 45% of the cases. On average, dairy cows remain on the farm at calving and produce milk for 4-6 years, in 25% and 27% of cases, respectively. Very few cows (2%) remain on the farm for more than ten years. During this time period, 4-6 calves are born, with five being the average in 35% of responses. Although 30% of farms did not use any software to keep track of or manage herd production and reproduction, the most common ones used were *Dairy Comp 305* and *Afimilk*, which accounted for 25% and 22.73% of responses respectively.

Professional knowledge - Finally, emphasis should be placed on the level of theoretical knowledge acquired by veterinarians by the time of graduation. In fact, the results show that while, on the one hand 48% of respondents claimed they had received the necessary theoretical knowledge to deal with the needs of the profession, on the other hand 52% were not satisfied with the amount and type of training received. In particular, among the subject areas they suggested should be further enhanced were: microbiology, parasitology, surgery, and animal husbandry.

ACADEMIC TEACHERS

Geographical areas of work - Taking into consideration the results of the questionnaires administered to teachers, the veterinary schools at which they were employed were mostly located within the Samarkand geographical area (in 40% of cases), followed by the Andijan area (31%). A lower number of respondents were from the Tashkent and Karakalpakstan areas.

Practical training – With regard to the question concerning the percentage of time within the food animal medicine, surgery and reproduction subject area that was allocated to deal with “pathophysiology of diseases”, “clinical examinations”, “presentation of real life clinical cases” and “treatment protocol discussion”, the responses of interviewed teachers are tabulated in Figure 2. The discussion of “treatment protocols” was the only case where all of the respondents declared the allocation of at least 50% of their class time dealing with such a topic. In all of the other cases, the average time allocated to discuss the relevant topic was 25%. The vast majority of interviewees also confirmed that their students had the chance to spend a training period on a farm or at a slaughterhouse, in 79% of cases, ensuring that they were also involved – both actively and passively – in clinical activities. In the case of passive involvement, most of the cases were related to animal surgeries (66), with fewer cases dealing with animal reproduction (49). However, the same did not apply to students being actively involved in clinical cases, where the contrary was true and 63 animal reproduction cases were reported.

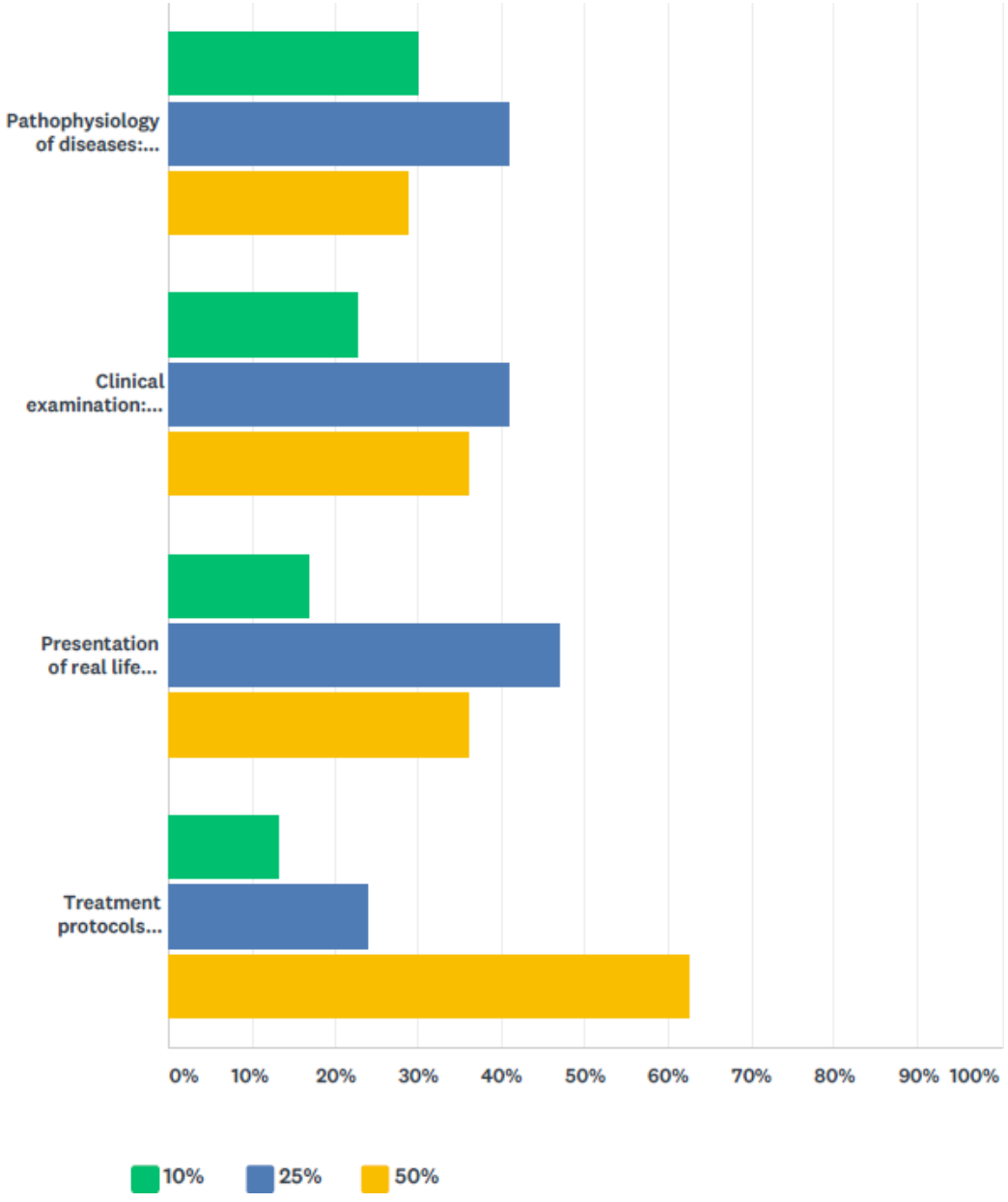

Figure 2. Percentages of time spent per area

Based on the answers provided, during their training students performed between five to ten rectal palpations in 33% of cases and more than twenty in 23% of cases, with a very low number of students (9%) performing between one to two palpations throughout their degree. The results further suggested that students were more likely to diagnose pregnancy in cows at 60 days from gestation (61%), rather than at 40 days (55%).

In order to investigate whether there was an even distribution between theoretical and practical activities, teachers were also asked to provide an estimate of the number of hours they allocated to one or the other form of teaching by taking into consideration nine different subjects (Figures n. 4 and 5)

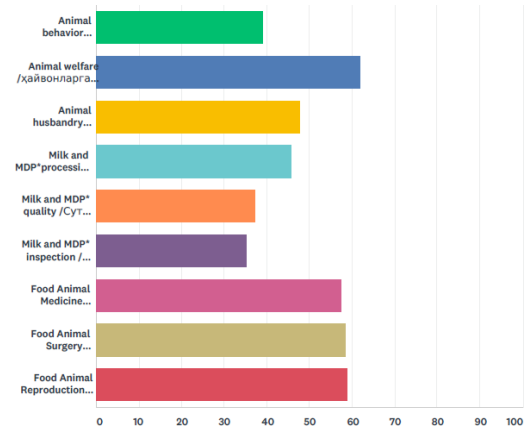

Figure n. 3. No. of hours allocated to theoretical teaching activities

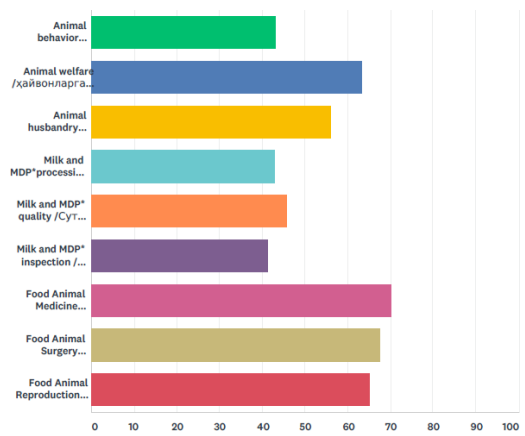

Figure n. 4. No. of hours allocated to practical teaching activities

Although no major discrepancies were observed between figures 3 and 4, thus confirming an even distribution between theoretical and practical hours, some conclusions could still be made. In particular, whereas in Figure 3 there was a slight difference in the numbers of theoretical hours delivered within the Milk and MDP (Milk Derived Products) subject areas, the same could not be said with regard to Figure 4, where the gap narrowed and the number of practical hours ranged between 41 to 46. With regard to the latter, teachers claimed that students spent an average of four to eight hours in Milk and MDP processing plants as part of their practical training on inspection and quality assessment in 36% of cases, actively performing sampling and diagnostic procedures most times (74%).

Group sizes for practical training - When performing their practical, hands-on activities in the aforementioned subjects, students were divided into groups of different sizes, mostly based on the subject area. In general, groups were composed of either 6-10 or 10-15 students in most cases. A very low percentage (and in any case never above 10%) of teachers divided students into groups of 2-4 students each. Groups composed of 4-6 students were most common within the Food Animal Surgery and Reproduction subject areas, with a percentage of 33%.

With regard to teaching techniques specifically, the vast majority of respondents were either familiar with or had used the following teaching methods: active learning (e.g. problem solving), case-based learning, role playing and structured team-based learning. All of the aforementioned learning modalities achieved a positive rate of between 82% and 91%, with active learning being the most used tool among teachers. However, teachers further explained that in spite of using either one or a combination of the aforementioned techniques, results were still affected by a number of issues which required action. In particular, when dealing with the teaching of large animal medicine, surgery and reproduction, interviewees pointed out that the lack of sufficient practical training, equipment and clinical cases was a problem in 46%, 27% and 24% of cases, respectively. Only the acquisition of new basic equipment, such as microscopes and surgical instruments, along with the enhancement of teachers' pedagogical training and the introduction of new teaching techniques would give better results for this. Notwithstanding this, the questionnaire also noted a number of strengths, among which were the growing demand for qualified veterinarians, the chance to treat a variety of animals and the improvement of practical training.

MILK SECTOR OPERATORS

Geographical area of work - Almost 60% of milk sector operators interviewed for the purposes of this document came from the Tashkent geographical area, followed by the Andijan and Fergana areas.

Milk contaminants - Chlorine was more likely to be detected in 30% of cases, whereas hydrogen peroxide, and peracetic acid and fungi were present in 18% and 13% of cases. In the vast majority of cases, a certificate of conformity was the main quality tool in place.

Types of milk produced - Among the different types of milk produced for human consumption, pasteurized and sterilized milk were the most commonly reported, accounting for 45% and 36% of responses. Whereas these were equally commonly used in the production of cream and butter, untreated milk was preferred for the production of cheese, where this was used in 67% of cases. A combination of raw milk and pasteurized milk was also used in the production of butter (42%).

HACCP system - Although this system was largely in place in milk processing plants (81%), data show it was less common in both primary production plants and throughout the commercialization chain, with percentages of 56% and 51% respectively. Moreover, it should be noted that in spite of the fact that in more than 50% of the processing plants where the interviewees worked there was a staff member in charge of quality assessment, in only 13% of cases this quality evaluation was carried out by a veterinarian.

Students' level of theoretical knowledge - Although over 78% of respondents claimed to be satisfied with the students' level of theoretical knowledge, they suggested that further training should be provided, with a focus on artificial insemination and quality assessment procedures.

FARMERS

Geographical area of work - Most of the farmers interviewed were from either the Tashkent or the Andijan geographical areas, with percentages of 32.14% and 27.38% respectively.

Types of farms - An equal number of respondents claimed the average number of cows present on their farm was between 10-20 (24% of cases) and 20-50 (24% of cases), although in 25% of cases it was more common to find more than 100 cows. The vast majority of these farms were family-run businesses (80%), mainly employing 2-5 people. A higher percentage of employees were reported in the cases of private enterprise businesses, where the number of workers usually ranged between 7-15 (39%). As was underlined by the outcomes of the questionnaires submitted to veterinarians, animal production was also the main supporting activity for farmers in 83% of cases.

Type of housing - Tethered housing and group pens were mostly used, in 57% and 42% of cases, respectively. As regards the ventilation conditions present on the farm, mechanical (e.g. fan) and passive ventilation, such as windows and openings on the wall and/or ceiling, were the most common, with percentages of 42% and 39% respectively. Once again concrete flooring was commonly reported to be used in 65% of cases. According to farmers, lighting conditions and bedding space were thought to be good and sufficient.

Reproductive management - Some attention should be made in regard to the time necessary to diagnose pregnancy in dairy cows. In fact, whereas the Uzbek veterinarians interviewed claimed that the average number of days after which pregnancy was diagnosed was 60, farmers declared pregnancy was more likely to be detected after 90 days from the

date of artificial insemination (55%). To this end, particular attention should also be given to heat-detection techniques. Drawing a comparison between the data gathered from veterinarians' answers and those from farmers, it could be observed that most of the techniques listed in the questionnaire were more known among farmers than among veterinarians. Examples of this were pedometers and Kamar patches, for which the percentages of farmers who had heard about them but did not have the chance to use them were 49% and 52% respectively; which compares with 19% and 20% among veterinarians, respectively. This notwithstanding, the observation of cows for heat detection was reported to be routinely used in 21% of cases, with 40% of farmers further claiming to use it, but not for all cows. As regards the percentage of dairy cows that needed more than two artificial inseminations before becoming pregnant, this was low in most responses, although 37.35% of farmers declared between twenty to fifty per cent of dairy cows might undergo further artificial insemination procedures.
On average, dairy cows remained for between five to seven years on the farm, calving and lactating. During this period, between five to six calves were generally born, accounting for 33% and 29% of responses respectively. Although in only 27% of cases software was used to keep track of or manage herd production and reproduction, the most commonly used ones were *Dairy Comp 305e* and *Afimilk*, which accounted for 25% and 20% of responses respectively.

Milk contaminants - As concerns the type of chemical and microbiological contaminants that were more likely to be found in milk production plants, farmers claimed that chlorine and Enterobacter were the most widespread – with a percentage equal to 20.48%, followed by Listeria (16.87%), Peracetic acid (13.25%) and Hydrogen peroxide (12.05%). In the vast majority of cases, the certificate of conformity was the main quality tool in place.

Types of milk produced - Pasteurized and sterilized milk were the most commonly reported, accounting for 43% and 35% of responses. Whereas these were mainly used for producing cream and butter, untreated milk was preferred for the production of cheese, where it was employed in 67% of cases.

HACCP system - Although this system was largely in place in primary production plants (75.31%), data show it was less common in both the milk processing plants and throughout the commercialization chain, with percentages of 57.30% and 35.53% respectively.

Level of students' theoretical knowledge - Although 74.70% of respondents claimed to be satisfied with the students' level of theoretical knowledge, they suggested that further training should be provided, with a focus on artificial insemination procedures.

VETERINARY STUDENTS

Geographical area of study - Based on the outcomes of the student questionnaires, most of the interviewees were fourth-year students enrolled in the Veterinary Schools located either in the Karakalpakstan geographical area (37%), the Andijan geographical area (31%) or the Samarkand geographical area (26%).

Time devoted to various disciplines - When answering the question concerning the percentage of time within the food animal medicine, surgery and reproduction subject area allocated to deal with "pathophysiology of diseases", "clinical examinations", "presentation of real life clinical cases" and "treatment protocol discussion", students provided the following responses (Figure 5).

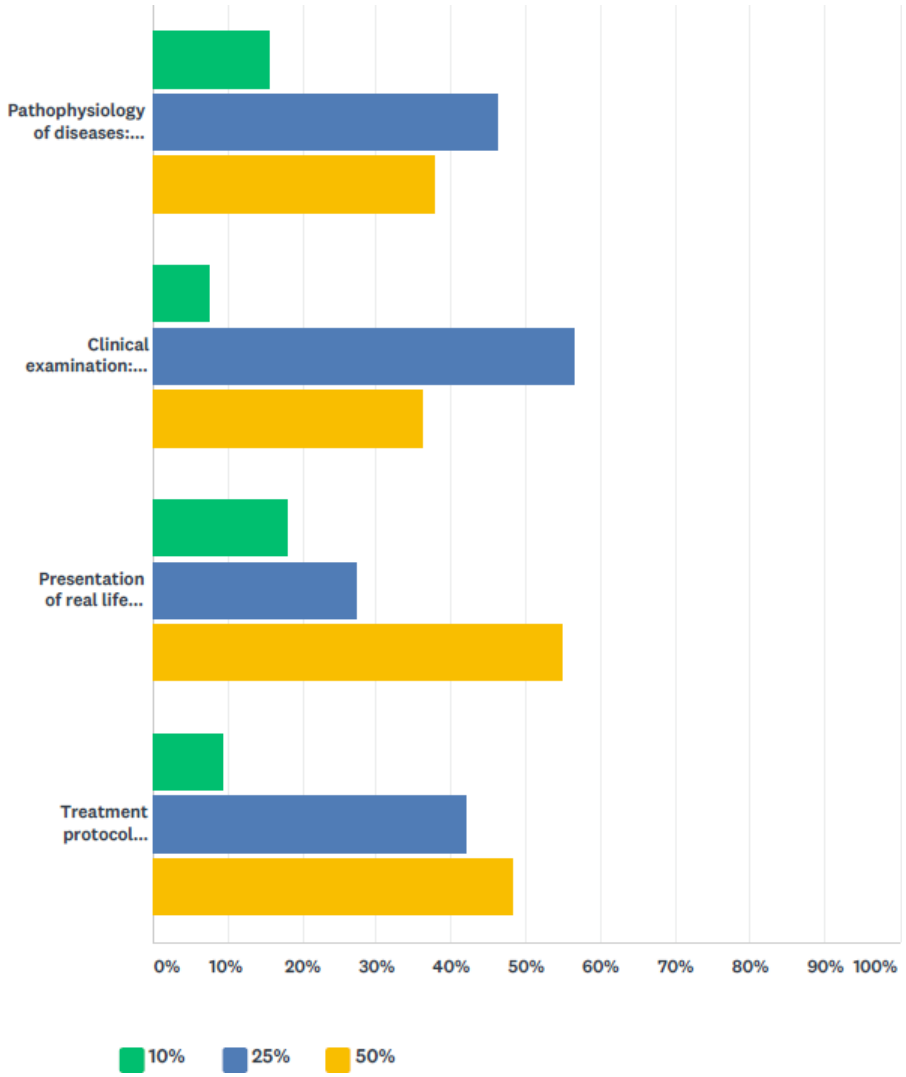

Figure n. 5. Percentages of time within the food animal medicine, surgery and reproduction subject areas allocated to each kind of teaching

As shown in figure 5, the presentation of real life clinical cases and the discussion of treatment protocols were the only cases where between 48.42% and 54.74% of respondents declared the use of at least 50% of their class time dealing with such topics. In all of the other cases, the average time allocated to discuss the relevant topic was 25%.

Practical training - The vast majority of interviewees also confirmed that they had had the chance to spend a training period on a farm or at a slaughterhouse in 87% of cases, ensuring that they were also involved, both actively and passively, in clinical activities. Based on the provided answers, during their training, students performed 10-20 rectal palpations in 37% of cases, with a very low percentage of students (3%) performing more than 20 palpations within their study period. The results further suggested that students were more likely to diagnose pregnancy in cows at 60 days from gestation (70%), rather than at 40 days (31%). In order to investigate whether there was an even distribution between theoretical and practical activities, students were also asked to provide an estimate of the number of hours allocated to either one of these forms of teaching, taking into consideration nine different subjects. Drawing a comparison between the results of the teacher questionnaires and those obtained from the student surveys, no major deviations were noted, confirming the findings of an even distribution between practical and theoretical teaching.

Teaching in milk production and quality - With regard to this, students claimed to spend an average of four to eight hours at Milk and MDP processing plants as part of their practical training on inspection and quality assessment in 51.61% of cases, actively performing sampling and diagnostic procedures most of the times (63.74%).
When performing their practical, hands-on activities in the aforementioned subjects, students were divided into different group sizes, mostly based on the subject area. In general, groups were composed of from six to ten and from ten to fifteen students in most cases. A very low percentage (and in any case never above 11%) of groups were composed of 2-4 students each. Groups composed of more than 15 students were common within the Animal Husbandry and Food Animal Reproduction subject areas.

Types of learning activities - With regard to teaching techniques specifically, the vast majority of respondents were either familiar with or had been exposed to the following teaching methods: active learning (e.g. problem solving), case-based learning, role playing and structured team-based learning. All of the aforementioned learning modalities achieved a positive rate of between 71% and 81%. In spite of this trend, however, students pointed out a number of issues which they consider require action. In particular, the lack of technical equipment and practical classes were considered as a weakness in 72% and 53% of cases respectively. Only the acquisition of both new basic (such as microscopes and surgical instruments) and state-of-the-art equipment, along with the introduction of new teaching techniques would improve results in the quality of the education delivered. Further improvements remain necessary regarding the provision of basic equipment, such as microscopes and basic surgical instruments, and teaching methodologies, which accounted for 61% and 49% of replies.
This notwithstanding, students also reported a number of strengths, including the high level of teachers' expertise, theoretical knowledge and practical training.

DISCUSSION

The response to our initiative was fairly good with close to 400 questionnaires received. A majority of answers were received from the Samarkand and Andijan regions, but the response was good also from the Tashkent and Nukus regions.

Farm size is fairly small with more than 50% of farmers taking care of a maximum of 10 cows. This corresponds to a situation similar to that of cattle farming in Europe the mid-1970's. Such a reality is characterized by a relatively low operator-cow ratio (1-5%), a strong tendency for single animal health programmes rather than for herd health programmes and therefore little or no interest of farmers/veterinarians in the use of computerized herd health management programmes. Types of cattle housing (the majority were tethered housing) and ventilation systems (predominantly passive) confirm the above observations and reflect the rather backward type of farming system in Uzbekistan. This was further confirmed by a key element of reproductive management, that is the average time at which pregnancy was diagnosed in cattle. In order for cattle farming to be more efficient pregnancy should be diagnosed prior to day 40 so that – in case the cow is not pregnant – another natural or artificial insemination can be performed at the subsequent heat. This is generally accomplished by performing a manual pregnancy diagnosis no later than 35 days after natural or artificial insemination. When pregnancy diagnosis is carried out 60 days after breeding or later, several heat cycles are lost in non-pregnant cows, with a considerable financial loss for the farmer.

Interestingly, the proportion of cows needing a second artificial insemination (45%) to become pregnant, as well as the length of production life for cows (only 4-6 years in about ¼ of all cows on the farm) do not seem to be very different from what is currently achieved in Western Europe. Regardless of what the reason for this might be, certainly cattle fertility is not exploited at its optimum efficiency in Uzbekistan. Not surprisingly, more than half of the veterinarians responding to the survey were dissatisfied with the level of knowledge they received in Veterinary School in this regard.

The answers provided by the farmers essentially confirmed the conclusions drawn above

Noteworthy are the discrepancies in the answers given for the main milk contaminants and the implementation of the HACCP system. The conflicting responses of the milk sector operators and those of the farmers lead us to suspect a lack of full awareness of the hygienic situation and organization for control. Transparency and information exchanges along the milk production chain, as well as proactive relationships between farmers/operators and official control is fundamental for the achievement of food safety targets. Moreover, the scarce involvement of veterinarians in processing plants is a demonstration of the low valuation of the food inspector role within the veterinary area and the necessity to give more emphasis to veterinary education and training in this sector. This is paramount considering the country's willingness to develop and modernize the agrifood industry and to align it with international standards.

With regard to the situation in academia, the amount of practical training performed in Uzbek Veterinary Schools in the four professional areas investigated by the questionnaires (pathophysiology of diseases, clinical examination, presentation of real life cases and treatment protocols) is also below what would be considered an acceptable standard in European Veterinary Faculties, with some students performing only 1 or 2 rectal palpations during their curriculum. The amount of practical training varies throughout the spectrum of disciplines with some disciplines perhaps performing better than other in terms of number of hours devoted to practice (see as an example Figures 3 and 4). However, students' group size remains a limiting factor as it is fairly difficult to be able to practice for instance a clinical procedure when 10-15 students are around one or only a few animals.

The responses provided by veterinary students are in line with what emerged from the teachers' questionnaires. Students are involved in practical training and clinical activities but the extent to which the entire class is offered opportunities to do practical activities is quite variable. Only occasionally students are divided into groups of 2-4, which is the ideal group size for a practical activity to be really of value. The exposure to active learning technique is quite good although its value is limited by the lack of equipment such as microscopes, surgical and other clinical instruments.

CONCLUSIONS

This investigation was performed under the BUzNet project in order to gain a clear view of the local Uzbek situation in terms of learning/teaching veterinary and zootechnical subjects, working conditions in these fields and the real situation on Uzbek farms and farming systems. The results of our questionnaire clearly identify the backwardness of the farming situation and the low degree of veterinary care provided by Uzbek veterinarians both for cattle farmers as well as for the milk industry. These are the areas where intervention is badly needed, and in fact it is purposely for these areas that the BUzNet project was initiated and developed. This information is paramount for the achievement of the objectives of the project, but also for other initiatives that aim to further develop the Uzbek veterinary and zootechnical sector as a whole. We hope that this report will be of help for future plans/projects implemented to develop the farming system and the veterinary profession in Uzbekistan.

A last word of thanks to all involved in this part of the project, from those that gave their time to answer the questionnaire to those who worked on analysing the results and writing this report.