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ASSESSMENT OF ECONOMICALLY USEFUL TRAITS OF BEE BREED IN THE SOUTHERN OF KAZAKHSTAN

ANNOTATION

Uncontrolled import of bee colonies leads to the metisation of bred breeds in our country. Breed testing of bees involves identifying the most promising breeds not only for the use of various sources of bribes, but also for accelerated development and increase in the number of families, and of course pollination of crops. To prevent the metisation of bees, researchers periodically monitor the breed composition and economically useful signs. It has been established that the growth rate of a bee family characterizes its winter hardiness and directly affects productivity. Based on this feature, queen bees with the highest egg production should be selected for breeding. More dynamic egg laying is observed in IE "Demidov" of the steppe zone averaged 919.6 pieces, and in IE "Gostinin" of the steppe zone, the egg production of queens is less by 2 pieces. The foothill and mountain zone lags behind the steppe zone by 14.6 eggs. The productivity of bee colonies also depends on the number of migrations to flowering honey plants. For example, when comparing the average honey productivity and wax productivity, variability is observed between stationary and nomadic content.

Key words: beekeeping, bee families, productivity, bee breed, evaluation, method, queen bee, drone, honey productivity

Introduction. Research into various aspects of honey bee biology has been increasing in recent years all over the world, including Kazakhstan, and negative processes are emerging in honey bee populations. The level of adaptability of bee colonies to environmental factors decreases. In particular, the death of bee colonies all over the world has been noted, which, according to many researchers, can lead to catastrophic consequences [1, 2].

Analysis and evaluation of many years of work by scientists allows us to state the fact that the management of any animal population should take place using fundamental methods for assessing the intrapopulation structure and its monitoring, which will subsequently lead to minimal transformation and regression of the intraspecific diversity of animals [3].

In many regions of the country, there is a haphazard, scientifically unsubstantiated and uncontrolled import and reproduction of bee colonies of different breeds, which leads to mass hybridization of bees, disadaptation of bee colonies and loss of their purebred [4]. In addition, as a result of hybridization, there is a loss of valuable economically useful traits and purebred bees.

In Kazakhstan, interbreed hybridization of bees has also reached alarming proportions, so an important problem in beekeeping is the preservation and improvement of the gene pool of bred bee breeds.

Imported Carpathian breed uteruses are widely used throughout the country. It is well known that this breed was zoned for Kazakhstan and for several decades has shown itself to be quite productive and resistant to bee diseases. The import of Carpathian bee queens has significantly dominated in recent years and was carried out from bee nurseries in Transcarpathia and other regions of Ukraine. However, in recent years, breeding material from these nurseries more and more often turns out to not correspond to the described standards, and crossbreeding with other breeds imported into the country led to the "erosion" of characteristic characteristics and their shift for the worse [5].

Consequently, beekeepers were faced with a situation where self-reproducing, as well as certified, queens from bee nurseries produced worker bees that did not correspond to any of the known breeds. This led to the massive import of breeding material from another breed of bees. In recent years, the Krajina bee breed *(Apis mellifera carnica)* has been gaining popularity. According to beekeepers, it has useful characteristics and qualities that make it possible to consider it as very promising for breeding in the conditions of our country. Such characteristics include peacefulness, winter hardiness and hard work. This breed combines the characteristics of the Carpathian and gray mountain Caucasian bees, so at present the carnica breed is widespread throughout the world [6, 7].

It should be noted that the Krajina bee was formed in the foothills and mountainous regions of the Alps (mountainous regions of Carniola and Carpathia, now regions of Yugoslavia and Austria). In this regard, it is well adapted to the climatic conditions of mountain and foothill areas, and it is expected that it will show its best qualities in the harsh continental climate of Kazakhstan.

The genus of the Kraine bee*(Apis mellifera carnica).* The color of bees is gray, with a silvery tint, the length of the proboscis is 6.4-6.8 mm, the relative width of the third tergite is 4.9 mm. The weight of a one-day worker bee is 110 mg, a barren queen is about 185, and a fertile queen is about 205 mg. The bees are peaceful, calm, and remain on the honeycombs when inspecting the nest. They are exceptionally enterprising in finding food sources and quickly switch from the worst source of honey collection to the best. When the honey flow begins, honey is placed first in the brood part of the nest, and then in the store [8].

The study of the patterns of growth of bee colonies, behavior, productivity, and the quality of their quality throughout the year provides a theoretical basis for the development of scientifically based ways of producing beekeeping products, and the integrated use of bee families.

The productivity of bee colonies of the Karnika breed is one of the biotic factors that have a significant impact on the biological life cycle of the family. The authors conducted research in 2016-2017 in the South Kazakhstan region. The results obtained indicate an increase in honey and wax productivity of bee families in the mountain and foothill zones; they showed good results in the yield of marketable honey from 48.0 to 52.0 kg, which is 2% higher than the steppe [9].

In terms of winter hardiness, Apis mellifera carnica is inferior to the Apis mellifera mellifera one, but is much superior to the Apis mellifera caucasia one. The bees are peaceful and calm, the family develops quickly in the spring and therefore effectively uses early honey plants. One can also note the low level of swarming, which does not exceed 30%. With timely implementation of anti-swarm measures, it easily switches from a swarm state to a working state, from the worst honey collection to the best. First he fills the brood part of the nest with honey, and then only the store part. Used to pollinate red clover.

Apis mellifera carnica bees overwinter well in small families, consuming a small amount of food reserves. In Central Europe, where most areas have poor honey production and cold winters, bees of this breed are most popular among beekeepers. A distinctive feature of carnica bees is their very weak polising of nests.

TheApis mellifera carpatica breed of bees is common in many regions of Ukraine, Russia, Belarus and Kazakhstan [10]. Gray is the main color of this breed. The length of the proboscis in working individuals is 6.2-7.0 mm. Fetal queens weigh on average 205 mg and can lay up to 1800 eggs per day. The carpatica breed of bees has been known since ancient times. Typical representatives of this breed are bees from the high mountainous regions of the Transcarpathian region, adapted to the harsh wintering conditions, and are gentle. They inhabit the mountainous and foothill regions of Western Ukraine.

It has been established that in the Transcarpathian region, in harsh mountain conditions, the local gray carpatica bee lives, which in most exterior and biological characteristics is close to the carnica bee. At the same time, it differs from it in being more peaceful, timid, good winter hardiness, high rate of spring development and good pollinating activity [11].

At the same time, the created new lines of carpatica bees differ from the carinica bees in their high flight honey-collecting activity and pollinating ability [12].A comprehensive assessment of bee colonies of the 54th line made it possible to certify them as a new type of bees “Moscow” of the carpatica breed. They are intended for use in pollination and increasing the yield of difficult-to-pollinate agricultural crops in open (red clover) and protected soil (cucumbers, tomatoes, eggplants), reproduction of queen bees and the formation of very early bags for the production of commercial honey.

Bee colonies of the third group with queens of line 77 of the carpatica breed of the current year of birth in 2021 collected an average of 14.8 kg of honey, which is 2.5 times more compared to bee colonies formed from queens of the current year of birth in the apiary. It should be noted that bee colonies with queens of line 77 were formed 2 weeks earlier, since the queens were delivered from a beekeeping farm in the south of the Russian Federation. The costs of purchasing queens of line 77 were fully recouped due to the received commercial honey from bee colonies [13].

The structure of the breed is heterogeneous and consists of populations that differ significantly in biological and economic characteristics. Preservation of genetic resources of honey bees, their selective improvement and rational use makes it possible to increase honey production by at least 20% [14].

Materials and research methods. The object of the study was bees of different breeds (carpatica, carnica) and a local population of 600 families bred in the southern region of Kazakhstan.

The experimental part was carried out in 6 basic farms: IE "Demidov", IE "Normukhamedov", IE "Gostinin", Shymkent, LLP "Eko-med", PSP "Nazipov R", LLP "SunBeeUgam" of the Turkestan region.

The determination of whether bees belong to a certain breed type, population and line was carried out using measured characteristics of the wings (distances between the points of intersection of veins, their relationships, angles between veins) and the proboscis of bees according to the method of V.V. Alpatov [15].

The honey productivity of bee families depends on the presence of honey collection in nature and the ability of bees to use it. The availability of honey collection depends on the quantity and quality of honey plants, as well as climatic conditions. Its use by bees depends entirely on their physiological state. Among the Bee families, large changes in honey productivity are observed in each apiary. It depends on their strength, health and activity in collecting, importing and processing nectar. Honey productivity is determined by the total honey yield per family on average for each group [16].

To conduct laboratory studies to determine compliance with the breed standard of bees, live bees were recruited from the center of the nest from the center of a honeycomb frame with sealed brood into a glass jar of 30-40 bees. Then they poured boiling water over it and after 2-3 seconds poured it onto a gauze napkin. A label indicating the apiary, family number, and date of sampling was signed with a pencil. Then the gauze with the bees and the label was tied and placed in a jar with 70% alcohol. To determine the size of the proboscis, the proboscis was isolated from the mouth parts, the bee's head was separated from the chest and placed on a glass slide with the occipital part up. A dissecting needle was pressed on the occipital foramen and the place of attachment of the main oral apparatus to the head was discovered. Using tweezers, grasping the chin and pendants of the lower jaws, they separated it from the head. The drug was placed on a glass slide in a drop of glycerol, straightening all the parts with a needle and covering with a coverslip. The proboscis was measured by the distance between the tip of the proboscis - the distance between the protrusions. 50 pieces were selected and placed in the freezer for further research [17.18].

To carry out morphometry of the honey bee wing, the right fore wings were taken. To scan the wings, we used wide, transparent tape with evenly applied adhesive. The tape was unwound on the table with the sticky side up and secured so that it would not curl. Armed with nail scissors and tweezers, grabbing the bee by the chest with tweezers, they cut off the wing at the very base with scissors. Using tweezers, we carefully glued the underside of the wing onto the tape, trying to ensure that there was no air under the wing, and glued it horizontally, arranging the columns as close to each

other as possible. After gluing all the wings, we covered the top with another piece of tape so that the wings were between the two sticky sides of the tape [19.20].

The wings were scanned with a resolution of at least 1600dpi. To place points on the wings, the tpsDig2 graphic editor was used. The obtained data were statistically processed by the MorphoEXCEL program. The obtained material was processed by the method of variation statistics [21]

Results and its discussion. Of particular practical interest for purebred breeding is the indicator of egg production of the uterus, depending on the method of insemination. When monitoring the growth of bee colonies by measuring the average daily egg production of queens. The egg production of the ancestor's uterus, the uterus of the paternal families with the uterus of the daughters was taken into account. The growth rate of the bee colony depends on the egg production of the queen, in accordance with Table 1.

Table 1 – Egg production of queen bees, eggs

Name farms	Disengagement zone	Egg production of the queen bee, eggs per day						Average
		first measurement		second measurement		third measurement		
		M±m	CV,%	M±m	CV,%	M±m	CV,%	
IE "Demidov"	steppe	506±0.83	17.5	935±19.8	13.6	1318±15.9	15.3	919.6
IE "Normukhamedov"	steppe	504±0.95	15.5	927±19.2	18.3	1312±14.7	14.6	914.3
IE "Gostinin"	steppe	509±0.82	16.1	924±21.23	19.6	1320±15.7	15.1	917.6
LLP “Eco-med”	mountain	496±0.99	15.8	849±0.76	15.3	1300±14.7	14.6	881.6
PSP "Nazipov"	foothill	502±0.92	12.1	905±1.13	15.9	1308±16.4	14.7	905.0
LLP “SunBeeUgam”	mountain	500±0.95	12.8	903±1.09	15.4	1301±14.9	14.3	901.3

The data in Table 1 show that high egg production provides the colony with a large number of young bees, even in the dry period; this helps to maintain the family structure and the ratio of brood to young bees at the time of intensive growth. The growth rate of a bee colony characterizes itwinter hardinessand directly affects productivity. Based on this trait, queen bees with the highest egg production should be selected for selection. More dynamic egg laying is observed in the Demidov IE of the steppe zone, on average 919.6 eggs, and in the Gostinin IE of the steppe zone, the egg production of queens is 2 pieces less. The foothill and mountain zones lag behind the steppe zone by 14.6 eggs. The lowest egg production rate was recorded in the Turkestan region at Eco-med LLP - 881.6 eggs from the mountain zone.

Thus, low rates in the foothill and mountain zones are justified by climatic conditions for egg production such as wind, rain, clouds and low temperatures compared to the steppe zone, where high rates of egg laying are recorded.

Assessment of quantitative brood before honey collection. During the period of intensive growth in the number of workers, before the onset of the main honey flow, pollen collectors, nurses and construction bees predominate in the family. As a result of this process, the bee colony becomes physiologically ready for the ability to raise a lot of brood, actively build a nest and effectively use the honey flow, in accordance with table 2. This is where the main productive qualities of a bee colony are manifested.

Table 2 – Amount of brood before honey collection

Name farms	Force 1 h/s, in streets	Number of printed brood, hundreds of cells
IE "Demidov"	12.2±0.05	1719±10.3
IE "Normukhamedov"	12.0±0.05	1712±10.1
IE "Gostinin"	11.8±0.09	1710±10.4
LLP "Eco-med"	11.0±0.10	1675±15.3
PSP "Nazipov"	11.6±0.09	1705±10.2
LLP "SunBeeUgam"	11.1±0.10	1680±14.5

According to the results of studies, the use of honey resources by bees in the steppe, mountain and foothill zones showed that during the honey harvest season, bees actively use supporting honey in the steppe zone, in accordance with Table 3.

Table 3 – Assessment of the productivity of bee colonies

Name of farms	Disengagement zone	Honey productivity, kg		Wax productivity, g	
		M±m	Cv, %	M±m	Cv, %
IE "Demidov"	steppe	23.0±0.39	7.4	239±0.87	1.23
IE "Normukhamedov"	steppe	24.8±0.39	6.8	251±0.68	1.17
IE "Gostinin"	steppe	25.4±0.37	6.7	262±0.76	1.12
LLP "Eco-med"	mountain	22.7±0.35	7.5	232±0.95	1.26
PSP "Nazipov"	foothill	22.9±0.40	7.4	233±0.76	1.20
LLP "SunBeeUgam"	mountain	22.2±0.38	7.3	230±0.96	1.27

An analysis of Table 3 shows that the productivity of bee colonies also depends on the number of migrations to flowering honey plants. For example, when comparing the average honey productivity and wax productivity between stationary and nomadic housing, variability is observed. The apiary of Eco-med LLP, located on a stationary honey collection, showed an average of 22.7 ± 0.35 kg of honey, and 232 ± 0.95 g of wax, a similar picture is observed in the apiary of SunBeeUgam LLP - 22.2 ±0.38 kg; 230±0.96 g. And in nomadic apiaries the highest indicator is for IE “Gostinin” for honey 25.4±0.37 kg, for wax 262±0.76 g. A feature of this apiary is the nomadic movement in the steppe zone from the Zhambyl region to Turkestan region. Also, good productivity results were shown by the farms of IE “Demidov” and IE “Normukhamedov” - 23.0±0.39; 24.8±0.39 kg and for wax 239±0.87; 251±0.68 g, respectively. During the main honey harvest, 4-5 migrations were made to wild steppe honey plants. In the base farm of the PSP "Nazipov" private household plot, an average level of honey productivity is observed at 22.9±0.40 kg, and for wax productivity 230±0.96 g.

Thus, depending on migrations and the availability of food supply, the level of honey collection varies. At a prolonged and high level, the yield of commercial honey increases. There are periods when a flowering honey plant does not produce nectar, and accordingly the yield of commercial honey decreases. The strength of the colony and the number of brood directly affects the main honey yield, which, under favorable climatic conditions, will contribute to a greater amount of honey production.

Assessing the condition of apiaries before wintering. The main task of a beekeeper in the autumn is to create strong colonies with a large number of young bees. Such families tolerate wintering well, develop quickly in the spring and use all the tricks. Therefore, at the end of the main bribe, all bee care should be aimed at ensuring that the bee colonies spend the winter with the least loss and weakening, in accordance with Table 4.

Table 4 – Assessment of the condition of apiaries before wintering (n=70)

Name of farms	number of printed brood, hundreds of cells						Average
	(first measurement)		(second measurement)		(third measurement)		
	M±m	CV,%	M±m	CV,%	M±m	CV,%	
1	2	3	4	5	6	7	8
IE "Demidov"	842±0.78	15.2	2105± 11.9	17.8	4362± 1.6	10.1	2446.3
IE "Normukhamedov"	838±0.72	15.7	2099± 12.3	17.4	4348± 1.3	13.7	2428.3
IE "Gostinin"	850±0.76	15.3	2083± 12.3	17.4	4320± 1.3	10.7	2417.6
LLP "Eco-med"	814±0.79	15.4	1942± 11.1	17.6	4094± 1.2	10.5	2283.3

1	2	3	4	5	6	7	8
PSP "Nazipov"	820±0.72	15.5	1949±11.5	17.6	4188±1.5	10.5	2319.0
LLP "SunBeeUgam"	812±0.72	15.2	1785±18.0	14.4	3920±9.6	12.6	2172.3

Thus, according to the results of Table 6, it can be seen that the brood was placed in all measurements on 3 honeycombs, which occupied an area of 102 square meters. This change in the amount of brood is the reason why the number of individuals is small and they cannot raise more brood. Therefore, during this period the influence of growth stimulants is small.

During the inspection, it was revealed that in the farm of IE “Demidov” the amount of brood is greater than in IE “Gostinin” by 28.7 hundred cells, while in LLP “SunBeeUgam” there is the smallest amount of brood by 274 hundred cells compared to IE “Demidov” .

Thus, the successful outcome of the wintering of bee colonies can be predicted by the rearing of brood. So, based on the research results, it can be noted that the most favorable outcome of wintering may be for farms in the steppe zone.

Assessment of purebred bee colonies. Assessment of exterior characteristics helps determine the genetic value of the queen bee, paternal colony and their potential productivity. If the worker bees of a given family have all the characteristics of a certain breed, its potential is high. To obtain a complete picture of the breed composition of bee families, samples were taken from the studied bee families for morphometric and exterior analysis. To determine the exterior of the bees, the following were measured: proboscis length, cubital index, discoidal displacement, wax speculum border, body color, honey signet, inspection behavior and bee weight, in accordance with Table 5.

Table 5 – Valuation of bee colonies (n=10, ∑=60)

Proboscis length, mm	Cubital index, %	Discoidal displacement .%			Wax mirror border			Body coloring	Signet of honey	Behavior during examination
		+	0	-	Straight	Bent.	Offset			
IE "Demidov"										
6.3±0.03	39.8±0.29	86.3	13.7	-	+	+	-	gray	dry	moderately aggressive
IE "Normukhamedov"										
6.2±0.03	37.7±0.36	84.2	15.8	-	+	+	-	gray	dry	peaceful
IE "Gostinin"										
6.3±0.03	38.4±0.34	78.2	21.8	-	+	+	-	gray	dry	peaceful
LLP"Eco-med"										
6.4±0.02	38.6±0.34	76.3	23.7	-	+	+	-	gray	dry	peaceful
PSP "Nazipov"										
6.2±0.03	37.8±0.37	63.3	36.7	-	+	+	-	gray	dry	peaceful
LLP "SunBeeUgam"										
6.4±0.04	38.9±0.33	77.4	22.6	-	+	+	-	gray	dry	moderately aggressive

The data obtained in Table 5 show that for worker bees in the apiary of IE “Demidov” the length of the proboscis was 6.3 ± 0.03 mm, the cubital index was 39.85 ± 0.29, and in the discoidal displacement it was 86.3% positive. value, at the same time there is a neutral value - 13.7%, straight and curved are observed in the border of the wax mirror. The color of bee tergites is yellow, the signet of honey is dry, and when examining bee colonies, bee behavior is moderately aggressive. In working bees of IE “Normukhamedov”, the length of the proboscis was 6.2 ± 0.03 mm, the cubital index was 37.7 ± 0.36, in the discoidal displacement it had a positive value of 84.2%, at the same time there was a neutral value of 15 ,8%. When examining bee colonies, the behavior of bees is peaceful.

On the farm of IE "Gostinin" the results of measurements of bees show that the length of the proboscis is 6.3 ± 0.03 mm, the cubital index is 37.86 ± 0.37%, the discoidal displacement was 76.3%

positive and 23.7% neutral , the border of the wax mirror is curved, the body color of the bees is gray, the honey seal is dry, when examining bee colonies, the behavior is peaceful, which corresponds to the carnica breed. And Eco-med LLP has more in all indicators than IE Gostinin, except for discoidal displacement, the positive value is 76.3% and the neutral value is 23.7%.

In the foothill zone in the apiary of the Nazipov private farm, the signs of exterior indicators are lower compared to the steppe, the length of the proboscis is 6.2 ± 0.03 mm, the cubital index is 38.46 ± 0.34%, the discoidal displacement is 63.3%, neutral – 36.7%, the border of the wax mirror is curved, the body color of the bees is gray, the honey signet is dry, when examining bee colonies, the behavior is peaceful.

On the farm of SunBeeUgam LLP in the mountainous zone, the length of the proboscis was 6.4±0.04 mm, the cubital index was 38.9±0.33%, neutral - 22.6%, the border of the wax mirror was curved, the body color of the bees was gray, signet The honey is dry; when examining bee colonies, the behavior is peaceful.

Summarizing the data obtained, it can be stated that in all external parameters the bee corresponds to the standard of the carnica and carpatica breeds.

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РЕЗЮМЕ

Бесконтрольный завоз пчелиных семей приводит к метизации разводимых пород в нашей стране. Породное испытание пчел предполагает выявление наиболее перспективных пород не только для использования различных источников взятка, но и для ускоренного развития и увеличения численности семей, и конечно опыления сельскохозяйственных культур. Для предотвращения метизации пчелы научные сотрудники периодически проводят мониторинг породного состава и хозяйственно-полезных признаков. Установлено, что скорость роста пчелиной семьи характеризует ее зимостойкость и напрямую влияет на продуктивность. Исходя из этого признака, для селекции следует отбирать пчелиных маток с самой высокой яйценоскостью. Более динамичное откладывание яиц наблюдается у ИП «Демидов» степной зоны в среднем составило 919,6 штук, а у ИП «Гостинин» степной зоны яйценоскость маток меньше на 2 штук. Предгорная и горная зона отстает от степной на 14,6 штук яиц. Продуктивность пчелиных семей так же зависит от количества кочевок на цветущие медоносы. Так, например, при сравнении средней медопродуктивности и воскопродуктивности между стационарным и кочевым содержанием наблюдается изменчивость.

ТҮЙІН

Ара отбасыларын бақылаусыз әкелу біздің елімізде өсірілетін тұқымдардың бұзылуына, яғни гибридтенуіне әкеледі. Ара тұқымдарын бағалау бал алу кезеңіндегі әртүрлі көздерін пайдалану үшін ғана емес, сонымен қатар отбасылардың тез дамуы мен көбеюі үшін және, де

дақылдарды тозаңдандыру үшін ең тиімді тұқымдарды анықтауды қамтиды. Ара тұқымдарының гибридтенуінің алдын алу үшін ғылыми қызметкерлер мезгіл-мезгілімен тұқымдық құрамы мен шаруашылыққа-пайдалы белгілеріне мониторинг жүргізеді. Ара отбасының өсу қарқыны оның қысқы төзімділігін сипаттайтыны және өнімділікке тікелей әсер ететіні анықталды. Осы белгіге сүйене отырып, өсіру үшін жұмыртқалағыштығы жоғары болған аналықты таңдау керек. Дала аймағының «Демидов» ЖК-дің омартасында аналықтың жұмыртқа салуы, орта есеппен 919,6 дана, ал дала аймағының «Гостинин» ЖК-де аналықтың жұмырқалауы 2 данаға аз. Тау бөктері мен таулы аймақта, далалық аймаққа қарағанда 14,6 дана жұмыртқаға артта қалады. Ара отбасыларының өнімділігі, гүлді бал өсімдіктеріне көшу санына да байланысты. Мәселен, орташа бал өнімділігі мен балауыз өнімділігін стационарлық және көшпелі омартасымен салыстырған кезде өзгергіштік байқалады.

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METHODS FOR IMPROVING REPRODUCTIVE AND PRODUCTIVE ABILITIES OF QUEEN BEE IN THE SOUTH OF KAZAKHSTAN

ANNOTATION

A study was carried out on the development of breeding methods, improving the productive and reproductive qualities of queen bees. The intake and size of fed queen cells, the dependence of the mass of queens on the mass of the host family, the effect of honey-bee-bread feeding of host families on the volume of queen cells and the weight of queens, as well as various methods of replanting into full-fledged families were studied. It has been established that with less upbringing of queen cells, the nurse bees intensively fill the bowls with royal jelly, while the larvae that receive a large amount of food increase in size and, when they emerge, the weight of the barren queen increases. The quality of the queens is largely determined by the conditio ns of their cultivation and feeding in the nurse colonies, while it was determined that the highest live weight of the uterus is observed in strong nurse colonies with a composition of bees of different ages. The stronger the foster family was, the higher the quality of the queens. The most effective method of replanting fetal queens was the replanting of fetal queens in a cell, which guarantees a successful 85% intake. When using various methods of replanting fetal queens in full-fledged colonies, it was shown that it is much easier to plant a new queen in small colonies that are in a state of intensive growth than in strong ones, while young non-flying bees practically do not show aggressiveness towards the replanted queen.

Key words: *beekeeping, queen bee, hatching, mother liquor, egg tubes, live weight.*