Food Security of Russia and The Potential for Livestock Food Security of Russia and Potential Opportunities of Animal Farming

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The problem of food security

In the era of globalization and savage struggle for repartition of provisions international market, under the conditions of sanctions against our country the problem of food security is an essential component of homeland security. It includes questions of economic and political independence of a country, physical and psychiatric health of living and future generations of the Russian nation.

Proper subsistence support is the very first human need. Health of the Nation, its intellectual and production capacity and social peace of society depend on quantity with quality of provisions taken in by people (Glaziev, 2015).

The development of globalization processes called for measures at the domestic level to ensure sufficiency of provisions as a part of national sovereignty with creating conditions of adequate and healthy nutrition of people in our country (Lisitsyn, 2005).

The state influence in agricultural sphere of economy in order to provide food sovereignty is one of the social goals of national policy and put forward by many countries as higher priority in comparison with military security. The exporting countries of food products determine not only price policy in the world market but can also exert political pressure on a country non grata at any moment, including economic sanctions.

In the near term one of the core development goals of national agroindustrial complex is the rise of the volume of output of
competitive at the price and quality products to the level that is necessary for a regular food supply to people (Sergeev, 2005).

**Potential livestock**

Maximum growth potential has the domestic animal farming. This growth is defined by capability of development of the domestic fodder base, defensibility of the domestic market refocused on import substitution. This also promote interests of domestic manufacturer of animal products and allows to convert the growth of community need in meat and milk products into maintenance of high rate of increase factor, not only in agriculture but also in other associated sectors of the Russian economy. So one of the important components of effective livestock development is the formation of a quality infrastructure, this aspect plays a key role in housing and communal services, namely uninterrupted supply of energy farms, etc. (Kryukova et al., 2013; Kryukova et al., 2014). Do not forget that agriculture has had a tangible impact on the development of the tourism industry and hospitality mills, in recent years actively developing agricultural tourism (Kaurova et al., 2014; Maloletko et al., 2015), the high importance of the agro-industrial complex in the psychological adaptation of patients to rehabilitation programs (Vinogradova et al., 2015).

Also the development of livestock in the context of the development of the agro-industrial complex of Russia may become one of the directions of the strategy of diversification of the economies of single-industry towns of Russia, which is an important task for the formation of efficient national economy as a whole. (Kryukova et al., 2013; Kaurova et al., 2014; Kryukova et al., 2014).

Animal products like meat, milk and other output are consumed every day and are the most valuable type of provisions and the primary source of protein. Animal farming gives valuable sorts of industrial raw materials for industry, like wool, leather, lamb pelt etc. The development of animal farming allows to use more fully labor and material and technical resources in the agricultural sector throughout the year. In this field garden waste are used, and valuable organic manure are created (rtemova, 2008).

Over the last years a great production increase of poultry and pork took place in Russia. But beef and mutton production in a great measure doesn’t fit the needs of our country. At the same time slightly come into account potential opportunity of domestic sheep breeding and socio-economic aspects in mutton and chevon production increase for quick providing of food security of Russia. Thus sheep are notable for high early maturity. In potential fertility these animals are third after swines and rabbits. Within 9 -10 months you can get from a sheep no less of mutton than beef from one cattle animal unit considering that sheep is equal to 0, 1 of one cattle animal unit. The analysis carried out by the authors shows that in fattening fine-wool sheep by the standards recommended by the national science to get 1 tonne of lamb meat (of body weight) it is needed to expend feed by 2.4 and by 1.8 times less than to get the same volume of beef and pork. But at the same time expenditure of concentrate feed to 1 kg gain in weight in fattening sheep, is almost 3 times less than in fattening cattle and is almost 5 times less than in fattening swine. All these natural advantages of sheep should be used to obtain dietary meat, which is very popular among people of all nationalities in Russia (Dyachenko, 2013). The dietary value of mutton and chevon is due to low content of cholesterol (290 mpg to 750 mpg in beef and 745-1260 mpg in pork) and to the occurrence of lecithin in mutton fat. Lecithin is a substance with anti-sclerotic properties and it normalizes the interchange of cholesterol which provide more consumer performances to meat and promote higher mark prices (Dyachenko, 2008).

Upon the recommendation of Institute of Nutrition of the Academy of Medical Sciences of the USSR the proportion of mutton in balanced meat ration of a Russian citizen was to be 15% that is 12 Kg per caput. For this reason in 1960 in Soviet Russia in the whole production of meat the proportion of mutton and chevon was 12.3%. (rnco.net, 2014).

In just past three decades due to increase in population of the world and reduction of pastures the grassland farming in developed countries was slowly replaced by the feeding based on the grain production, the soy beans, the supplement feeds and growth promotants. Very
important was the development of industrial engineering of cattle fattening operation and the production of meat, which Russian agro-industrial complex don’t have properly today. Beef was beaten from first into third place in production of meat in the worldwide production (to 24.5%), since the structure of livestock inventory has been changed with account of feed efficiency (Shutkov, Shutkov, 2008).

The potential of sheep in substitution

To produce 1 Kg. of beef, it is needed at the average 8 Kg. of grain when it is needed 4 Kg to produce pork and 2 Kg to produce poultry. Because of these reasons the production of poultry and pork has risen sharply. Industrial production of mutton in sheep breeding is not as developed as in other branches of animal breeding. Thus sheep and goat breeding are beyond competition in consumption of grain, housing conditions and feasibility of using land that doesn’t fit for pasture of cattle (Ulyanov, 2014). That’s exactly why in worldwide production of meat the sheep population and the production of mutton have grown from 2.6% to 5.1% over the last years.

Maximum sheep population was reached in China – 138.9 million and in India – 74.5 million.

Whereas in Russia sheep and goat populations have been reduced from 66.3 million in 1983 to 22.0 million in 2013 having agriculturally used areas vastly superior to other sheep breeding countries in the world. Thus, there are about 12 hectares of a total area of the country per head in Russia. In comparison with BRIC countries – in China this rate is about 0.7 hectares, and in India this rate is about 0.3 hectares.

There are about 88 mil. ha of natural forage lands (pastures, hayfields, fallow lands) at this time in agricultural land-use in Russia. Sheep breeding is the main, and sometimes even the only mean of production that provides their usage for receiving the product, boosting employment and welfare gain of the local community. Due to the liquidation of the sheep breeding a large part of these lands are not used and retrograding at this time. The farms receive less products for billions rubles (Ulyanov, 014).

It follows the necessity of potential assessment of native species of sheep and fodder base of our country to solve the problem of food security of Russia by quick production increase of mutton and chevon for domestic consumption. At that it is necessary to judge by calculations 10 Kg. per man in a year or to 1 500 thousand tonne in a year taking into account the population growth up to 150 million people.

METHOD

The appraisal of extensibility of overall production of mutton

We shall consider the next pattern of the growth in production of mutton depending on the population of ewes by volume K in the sheep breeding farms. The animal yield from the population of ewes throughout the year is

\[ P = pK \]  

where:

- \( p \) – no. of yeanlings vs. no. of ewes, head, by the beginning of the year
- \( k \) of gimmers is divisible into 2 groups

\[ k = k1 + k2, \]

where:

- \( k1 \) gimmers that are used to replace unproductive ewes.

\[ k1 = aK, \]

where:

- \( a \) – no. of brood gimmer vs. no. of ewes, head, by the beginning of the year.

\[ k2 \] gimmers that are used for fattening and realization for meat.

\[ k2 = eK, \]

where:

- \( e \) – no. of meat gimmers vs. no. of ewes, head, by the beginning of the year.

\[ q \] ram hogs slated for fattening and realization for meat.

\[ q = cK, \]

where:

- \( c \) – no. of ram hogs vs. no. of ewes, head, by the beginning of the year.

From terms (1-4) follows

\[ p = a + c + e \]

From annual animal yield \( P \) the whole livestock \( q \) of ram hogs and \( k2 \) gimmers and \( K1 = aK \) of cull ewes are meant for realization for meat. For appraisal the meat productivity of the ewes
population of the fine wool breed sheep according with (1) we take \( @ = 0.8 \), no. of brood gimmer vs. no. of ewes, head, \( a = 0.25 \), at that the average slaughter weight of every \( q \) ram hog and \( k \) gimmer after fattening may be taken equal to \( h_1 = 17 \) Kg., and average slaughter weight of every \( k \) ewe after fattening according with data from the site (rnco.net,2014) may be taken equal to \( h_2 = 25 \) Kg.

Taking into account the stipulated conditions, the average volume of mutton \( H \) (slaughter weight) obtained throughout the year from the population \( K \) of structural ewes, may be defined from the next equation.

\[
H = h_1*(c+e) K + h_2* aK = K(h_1*c +e) +a h_2* K
\]

(6)

With \( K = 1 \)

\[
H_1 = h_1*(c + e) + h_2*a
\]

(7)

In accordance with the accepted terms and the equation (7) from one structural ewe at an average in slaughter weight can be obtained per year.

\[
H_1 = 17(0.4 + 0.15) + 25*0.25 = 15.6 \text{ Kg}
\]

For production \( H = 1500 \) thous. tonne of mutton in slaughter weight it is needed to have livestock of ewes at sheep breeding commercial farm units and farm enterprises no less than

\[
H/H_1 = 96 \text{ 200 thous. head}
\]

**The appraisal of expense of fodder for the development of sheep for meat**

Sheep breeding is a senile industry for many regions of Russia. According to figures fromNational Sheep Breeders Association there are 14 breeds of fine-wool sheep, 11 semifine-wool sheep, 2 semimhair sheep and 12 hair sheepfrom 39 cultivated breeds of sheep. Plus it is possible to find the most adapted breed to almost any region in Russia (rnco.net.,2013).

Growth, development and performance of sheep first of all depend on feeding level that is on quantity and quality of using fodder per head, per calendar day, per month, per annum.

There are general biological laws of metabolism in animal organism that can be phrased in the following manner:

a) The higher the feeding level the higher the productivity of animals and lower feed efficiency ratio

b) The higher the productivity of animals the higher the energy concentration on a per Kg. of ration dry matter

c) To get high productiveness, for health support, and for high reproductive functions of animals it is needed to deliver with ration every last nutrient that they need.

Modern scientific principles of animal nutrition are based on a vision of fodder as a complex of various food compounds that can fill certain needs which are specified by physiological state of the animals, their body weight, age, level and direction of their reproductive.

The appraisal of richness of fodder should be comprehensive with taking into account various food compounds. The energy appraisal of richness of fodder is just a part of such complex appraisal. In behalf of satisfaction of animal needs for food compounds with the purpose of detecting potential, genetically conditioned producibility, under normalized feeding the ration should contain: metabolic energy, dry basis, crude and digestible protein, lysin, methionine + cystine, sugar, starch, crude fiber, fat, calcium, phosphorus, potassium, sodium, chlorine, magnesium, sulfur, ferrum, cuprous, zinc, manganese, cobalt, iodine, carotin, vitamins: A(retinol), D (calciferol), E(tocopherol), B(thiamine), B(riboflavin), B(pantothenic acid), B (choline), B (nicotinic acid), B (pyridoxin), B (cyanocobalamine).

As a main aspect of rich energy-feed and the ration for animals, the value for metabolic energy (ME) in a unit of naturel fodder or dry matter is used. The metabolic energy of the food means is defined in metabolism (digestible) trials on animals or by means of a calculation from data of chemical makeup, digestibility of nutrilits and by using regression equation which for sheep is appear as following:

\[
ME = 17.71 dP + 39.89 dF + 13.44 dFb + 14.78 dFNE,
\]

\( dP \) – digestible protein, g;

\( dF \) – digestible fat, g;

\( dFb \) – digestible fibre, g;

\( dFNE \) – digestible free-nitrogen extract, g; (FNE are sugar, amylum, inulin, organic acids, glucosides and other substances)

It is established by agricultural science and confirmed by the practice that sheep can fully demonstrate its genetic potential of productivity
only with adequate and balanced feeding. Adequate feeding is first of all a rationed feeding, that provides balanced rations and satisfies the animals’ needs of food compounds in the best possible way. The rates of feeding of Farm Animals were developed and used in Russia. The rates took into account general biological laws of body metabolism and animals’ requirement in fodder (depending on a sort) with 20-35 indicators. In detailed rates the nutrient requirement is summary defined: to maintain animals’ life, production and reproduction. It is defined by the scientific research and the practical use of balanced ration that the productivity raises on 8 - 12% (Venediktov,1998).

Potential sheep

Let’s settle on a standard food requirement for a complete animal nutrition using fine wool breed sheep as an example.

Indeed, accordingly to “The rates of feeding ewes of wool-bearer breed and wool-meat breed” (Kalashnikov,1988) it is needed to take into account different feeding rates for yield and pregnant sheep, in first 12-months, pregnant and lactating sheep. The table 1 lists the rates of feeding yield sheep per head, per day.

With a grazing system the rates should be increased by 15-20 %.

According to standards of nutrient in fattening young sheep, the standard spend of nutrients (fodder unit) in fattening lamb starting from 15 Kg. of live weight at the beginning of fattening (at about 2 months age) and the index of weight gain of lambs live weight were defined by the authors. The results are given in table 2.

According to the standards of feeding the estimation of the spending of fodder per 1 centner of gain in weight in fattening youngsters and rejected mature sheep was obtained. The results are given in table 3. In this context it was found that it is needed up to 41% of the volume of the nutrients that are needed to annual sheep population management of the main herd of fine wool breed for fattening cull ewes and youngsters (in the year of birth)

Semi fine wool breed: about 53% of the volume of nutrient that are needed for annual sheep population management of the main herd.

Sheep population management of the main herd.

Capability assessment of fodder base for sharp increase of production of mutton in Russia

In provision of fodder for a sheep breeding the proper use of natural hay-fields and pasture-land is very important. Natural hay-fields and range lands cover 76.3 mln. hectare from which 18 mln. hectare are hay-fields and 58.3mln. hectare are pasture-land. Natural hay-fields and range lands for the most part are low-yielding and at an average give low fodder yield (6-10 fodder unit and 30-50 centners of herbage) (Surov, Serdyukov,2014).

The assessment carried out by the authors showed that under standard feeding of sheep to secure the minimal productivity index of the 1 class sheep per 1 structural ewe of fine wool breed, together with grazing system and green fodder it is needed no less than 8.0 c. f.u. of nutrients per year, no less than 9.0 c. f.u. per 1 structural ewe of meat-wool breed and no less than 11 c. f.u. per year per 1 romanov breed. Taking into account that fine wool breed are 75-76% of breeds of sheep in Russia and romanov breeds are about 1% then the average rate of housing structural ewe can be ~ 8.5 c. f.u. per year (Erokhin, 2004).

According to the data of Erhin A.I. the proportion of grass (herbage), haylage, silage and hay in the ration of sheep should be about 74% by nutrient density (6.3 c. f.u. per 1 structural ewe).

RESULTS

The potential of natural pastures.

Taking into account the given benchmark data let’s estimate the potential opportunities of fodder production for sheep breeding sub-branch of Russia and the tendency of its reconstruction and upbuilding to a required level in terms of volume and feeding quality of fodder. We shall start with reviewing the opportunities of range lands and hayfields (Shutkov and Dyachenko, 2011; Vinogradova et al., 2014; Maloletko et al., 2015).

In recent times the productivity of range lands in our country is 30-50 c. of herbage which is an equivalent of - 6-10 c. f.u. from 1ha (Surov and Serdyukov, 2014).
According to the data from Russian Academy of Agricultural Sciences (researchgate.net, 2013) the lands of commercial farm units and organizations cover 71% of all agriculturally used areas in Russia, whereby pasture fields of big and medium-sized companies cover 25580 thous. ha, and hayfields 7898 thous. ha.

That is why 33.5 mil. ha of range lands and hayfields of agricultural companies in Russia – upon condition that all these lands can be used for sheep breeding with their objective feeding capacity (270 mil. c. f.u.) – can provide succulent and roughage feed for about 40 mil. structural ewes or from 50.0 to 57.0 mil. heads of sheep (with 70-80% of ewes in the total stock of sheep). Yet these lands are busy with other production targets because with having only 4.7 mil. heads of sheep and goats in the companies of Russia in opinion of the head of R&D establishment animal and goat breeding in Stavropol Vasiliy Aboneev, the deficit of pasture-land is one of the hindrances that impede the development of sheep breeding (Aboneev, 2014).

Potential cultural pastures

Hence in case of reconstruction and upbuilding of sheep population in big and medium-sized companies their aiming basically at range lands is unpromising. A focused effort on creation new cultivated grasslands and maintaining the quality of the existing ones is needed, as well as increasing of sowing permanent grasses.

Our country has gathered a vast

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**Table 1.** The rates of feeding yield sheep wool-bearer breed and wool-meat breed in stable nursing system per head, per day

<table>
<thead>
<tr>
<th>S No.</th>
<th>Components</th>
<th>Live weight 40 Kg</th>
<th>Live weight 50 Kg</th>
<th>Live weight 60 Kg</th>
<th>Live weight 70 Kg</th>
<th>Average number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Fodder unit</td>
<td>0.9</td>
<td>1.05</td>
<td>1.15</td>
<td>1.25</td>
<td>1.15</td>
</tr>
<tr>
<td>2.</td>
<td>Metabolic energy mJ</td>
<td>10</td>
<td>12.5</td>
<td>13.5</td>
<td>13.5</td>
<td>13</td>
</tr>
<tr>
<td>3.</td>
<td>Dry basis, Kg</td>
<td>1.4</td>
<td>1.75</td>
<td>2.0</td>
<td>2.0</td>
<td>1.9</td>
</tr>
<tr>
<td>4.</td>
<td>Crude protein, g</td>
<td>150</td>
<td>160</td>
<td>170</td>
<td>185</td>
<td>170</td>
</tr>
<tr>
<td>5.</td>
<td>Digestible protein, g</td>
<td>85</td>
<td>95</td>
<td>105</td>
<td>115</td>
<td>105</td>
</tr>
<tr>
<td>6.</td>
<td>Fine salt, g</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>7.</td>
<td>Calcium, g</td>
<td>6.0</td>
<td>6.5</td>
<td>7.0</td>
<td>7.5</td>
<td>7.0</td>
</tr>
<tr>
<td>8.</td>
<td>Phosphorus, g</td>
<td>4.0</td>
<td>4.4</td>
<td>4.8</td>
<td>5.0</td>
<td>4.8</td>
</tr>
<tr>
<td>9.</td>
<td>Magnesium, g</td>
<td>0.5</td>
<td>0.6</td>
<td>0.7</td>
<td>0.8</td>
<td>0.7</td>
</tr>
<tr>
<td>10.</td>
<td>Sulfur, g</td>
<td>3.5</td>
<td>4.0</td>
<td>4.5</td>
<td>4.7</td>
<td>4.5</td>
</tr>
<tr>
<td>11.</td>
<td>Ferrum, mg</td>
<td>48</td>
<td>54</td>
<td>62</td>
<td>70</td>
<td>62</td>
</tr>
<tr>
<td>12.</td>
<td>Copper, mg</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>13.</td>
<td>Zinc, mg</td>
<td>34</td>
<td>40</td>
<td>46</td>
<td>52</td>
<td>46</td>
</tr>
<tr>
<td>14.</td>
<td>Cobalt, mg</td>
<td>0.43</td>
<td>0.5</td>
<td>0.57</td>
<td>0.64</td>
<td>0.64</td>
</tr>
<tr>
<td>15.</td>
<td>Manganese, mg</td>
<td>53</td>
<td>60</td>
<td>69</td>
<td>75</td>
<td>70</td>
</tr>
<tr>
<td>16.</td>
<td>Iodine, mg</td>
<td>0.43</td>
<td>0.5</td>
<td>0.57</td>
<td>0.64</td>
<td>0.58</td>
</tr>
<tr>
<td>17.</td>
<td>Carotene, mg</td>
<td>10</td>
<td>12</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>18.</td>
<td>vitamin D, IU</td>
<td>500</td>
<td>600</td>
<td>700</td>
<td>800</td>
<td>700</td>
</tr>
</tbody>
</table>

**Table 2.** The standard indicators of fattening lambs of wool-bearing and meat-wool breed

<table>
<thead>
<tr>
<th>Indicators</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>The age of a lamb (by the end of fattening)</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Monthly gain in weight, Kg</td>
<td>5.4</td>
<td>5.4</td>
<td>6.0</td>
<td>5.4</td>
<td>5.1</td>
<td>3.9</td>
<td>3.9</td>
</tr>
<tr>
<td>Spending on gain in weight, (fodder unit)</td>
<td>19.5</td>
<td>22.5</td>
<td>22.7</td>
<td>33</td>
<td>39</td>
<td>42</td>
<td>45</td>
</tr>
<tr>
<td>Added gain in weight, Kg</td>
<td>5.4</td>
<td>10.8</td>
<td>16.8</td>
<td>22.2</td>
<td>27.3</td>
<td>31.2</td>
<td>35.1</td>
</tr>
<tr>
<td>Spending of caloric units for added gain in weight</td>
<td>19.5</td>
<td>42.0</td>
<td>69.0</td>
<td>102.0</td>
<td>141.0</td>
<td>183.0</td>
<td>228.0</td>
</tr>
<tr>
<td>fodder unit/Kg of gain in weight</td>
<td>3.61</td>
<td>3.89</td>
<td>4.11</td>
<td>4.59</td>
<td>5.16</td>
<td>5.86</td>
<td>6.5</td>
</tr>
<tr>
<td>Live weight by the end of fattening</td>
<td>20.4</td>
<td>25.8</td>
<td>31.8</td>
<td>37.2</td>
<td>42.3</td>
<td>46.2</td>
<td>50.1</td>
</tr>
</tbody>
</table>
experience in organization and systematic usage of seeded hayfields and cultivated grasslands, which give heavy yield: to 180 - 200 c. of herbage (35 - 38 c. f.u.) and to 50 c. of hay from 1 ha and sometimes even higher and that is 5-fold more than feeding capacity of range lands and hayfields. Taking into account the unstable weather conditions it is preferable to apply irrigation on the parts of cultivated grassland because pasture irrigation is one of the effective ways of strengthening the fodder base of animal breeding at all zones. Irrigated pastures are notable for high-productivity (300-450 c/ha), the provide herbage uniformly and permanently. Sprinkling using sprinkling machines is an approved itself method of pasture irrigation. At the same time, there are some other methods: irrigation by surface flooding for 1-2 days, drop irrigation and so on. Upon that the whole production cycle and the usage of green fodder in a steady flow, produce two-three yields of one-year complex mixtures and up to five mowings of medick on the irrigated pastures which provide up to 100-115 c. f.u. from a 1 ha, 10.5-12 c. of digestible protein and 8-10 c. of sugar (Kalashnikov, 1985).

According to the data from Hanmagomedov S.G. with 13% of irrigated lands in farmlands, about 70% of plant production are collected on them i.e the productivity of irrigated lands are 15-fold more than the productivity of non-irrigated lands (Khanmagomedov, 2003).

<table>
<thead>
<tr>
<th>Breed of sheep</th>
<th>The spending of fodder per 1 centner of gain in weight (c. F.u)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine-wooled, incl. concentrates</td>
<td>3.460.66</td>
</tr>
<tr>
<td>semifine-wool, incl. concentrates</td>
<td>4.130.83</td>
</tr>
<tr>
<td>Romanov, incl. concentrates</td>
<td>4.951.09</td>
</tr>
</tbody>
</table>

Table 4. Feed composition in annual requirements per one ewe for certain breeds

<table>
<thead>
<tr>
<th>Index</th>
<th>Wool-bearing and wool-meat breed</th>
<th>Meat-woolbreed</th>
<th>Romanov</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roughagefeed, total %</td>
<td>16</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>incl. hay</td>
<td>12</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Haylageor silage</td>
<td>21</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Rootcrops</td>
<td>-</td>
<td>1.3</td>
<td>1.5</td>
</tr>
<tr>
<td>Grass</td>
<td>41</td>
<td>35.7</td>
<td>35.5</td>
</tr>
<tr>
<td>Concentrates</td>
<td>19</td>
<td>20</td>
<td>22</td>
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**DISCUSSION**

However it should be noted that in 1990 year agriculture of Russia had 21.2 mil. ha of irrigated lands, but to 2012 year the area of irrigated agriculturally used areas shortened to 4.3 mil. ha. Therefore in Russia there is the unused potential of irrigated agriculturally used areas that are to recovery at the rate of about 17 mil. ha. Their fodder potential is sufficient for supplying succulent and roughage feed to about 300 mil. ewes head which is equivalently to the production of about 4 500 thous. tonne of mutton annually. And that quantity of mutton and lamb is able to create a steady export potential for shipments to fast increasing countries of Southeast Asia and Africa.

It should be taken into account that at the present time sheep breeding is the branch of animal breeding that most closely meets the requirements of organic nutrition, the prices for which are much higher than prices for livestock products of breeding industry. The agriculture of Russia has the chance to take the rightful place in the market of organic nutrition. The geographical location of our country allows supplying the
organic animal products on the market of neighbouring Asian states the population of which grows at a quick rate with simultaneous growth in prosperity. Beyond that the development of sheep breeding in Russia on the currently unexploitable agricultural lands will allow to lessen the square of lands that are overgrown with weeds that create the real risk to the seeds of cereals and other food crops. It will also allow to reduce the use of pesticides for the fight against mentioned weeds, and reduce the ecological damage to the environment.

CONCLUSION

Sheep breeding is the main and sometimes even the only means of agricultural industry that can assure the usage of 88 mil. ha of natural forage lands (pasture-lands, hayfield, fallow lands) available in Russia. The considerable part of them at the present time is not in use and retrograding and the farms receive less products for billions rubles.

To provide in Russia the production of mutton up to 1 500 thous. tonne per year it is needed to keep reproductive herd with 120-125 mil. head where there 75 -80% of structural ewes. It is needed to keep scientifically-based normative feeding of sheep. With such increase the stock density of sheep and goats per 100 ha of lands in Russia will be only 6.6 head which is 2.1 times less than in China, 2.7 times less than in Brazil and India and 5.9 times less than in Turkey and Italy.

With a view to providing succulent and roughage feed under normative feeding of 96 mil. structural ewes, it is needed to create and use at an average either 5.5 mil. ha of green conveying forage lands at the irrigated plowed fields; either 16 mil. ha of cultivated grassland on the nonirrigated plowed fields using enough of fertilizations and well-timed agro-engineering measures; either 80 mil. ha of range lands and hayfields.

There is the undischarged potential of irrigated agriculturally used areas in Russia at the rate of about 17 mil. ha which is enough for supplying succulent and roughage feed to about 300 mil. ewes head which is equivalently to the production of about 4 500 thous. tonne of mutton annually.

Now therefore in Russia there are real potential possibilities of solving a problem not only of food security of Russia but also for developing a base for a steady export of mutton on the base of using gathered wide experience in organizing housing and breeding of sheep-breeding sub branch of animal breeding on the range lands and cultivated grassland and hayfields including the irrigated ones.

REFERENCES

11. Kryukova, E.M., Razumovskiy, S.L., Vetrova,


