CONTRACT RDADM000 - -- -

Beneficiary's co-financing

Non-commercial legal entity – Rural Development Agency (RDA) located at the legal address No 6 Marshal Gelovani Ave, Tbilisi, 0159, Georgia and the actual address is 10A Akhmeteli, 0159, Tbilisi duly represented by its deputy director ---------- on the one hand

And ---------- at the legal address ---------- -------, Georgia

whereas Ordinance No235 by the Government of Georgia (April 10, 2020) approved the Dairy Modernization and Market Access Project (DiMMA)

whereas Non-commercial legal entity – Rural Development Agency (RDA) is implementing the Dairy Modernization and Market Access Project (DiMMA) to develop the agricultural sector

whereas The Committee on co-financing made a decision (Minutes No---------- for the meeting of --------) on co-financing of the project submitted by ----------in his business model/business plan

Now therefore we jointly referred as the Parties and separately, as the Party have hereby concluded this contract and agreed on the following:

Definitions

RDA	Non-commercial legal entity – Rural Development Agency (RDA) registration code 404923785, all its assignees and legal successors.
Beneficiary	Natural person ---------- (personal No----------), LLC ----------(registration No ----------) sole proprietor (registration No----------) all their assignees and legal successors

DiMMA	Dairy Modernization and Market Access Project
Project	The project described in Annex No1, its costs and the list of fixed assets/works to be executed (if any)
Co-financing	The target funds paid by RDA to the Beneficiary under DiMMA in compliance with the contract terms
Tranche	A part of the total amount of the target co-financing to be paid under the contract
Confidentiality	Any information/documents about the other party received, processed, created and/or sent by either party and or other important information/documents shall be confidential.
Annex No 1	The project cost and the list of fixed assets/works to be executed
Annex No 2	The preconditions for the co-financing (tranche) disbursement and the evidence of its use for the intended purposes
Annex No 3	Standards of the farm building construction/modernization in case of primary milk production

1. Subject of the Contract

The subject of the contract is the co-financing amounting to GEL ----------to be paid by RDA to the Beneficiary as the part of the total project cost in accordance with the conditions of the present Contract including its annexes.

2. Rights and Obligations of the Beneficiary

2.1 The Beneficiary has the right to:

2.1.1 Request the co-financing to be paid by RDA according to the Contract provisions and DiMMA conditions.

2.2 The Beneficiary shall:

2.2.1 No later than within the period specified in Annex No2 to the Contract after the Contract execution ensure the fulfillment of the purpose (----------) envisaged by the project, including the implementation of ---------- (if necessary) and the commencement of ---------- as per the project, and in accordance with the conditions defined in Annex No3 (if necessary), as well as ensure the implementation of capital expenditures in accordance with Annex No2;

2.2.2 Maintain the ---------- profile envisaged by the project for 2 (two) years from the commencement of ---------- (if necessary) and/or ensure the fulfillment of the following obligation (----------) determined by the committee (if any);

2.2.3 Comply with the co-financing conditions specified in Annex No. 2 and the conditions defined in Annex No. 3 (if necessary). In case of a reduction in the project cost, ensure the return of the difference within the period determined by RDA;

2.2.4 Request and use the tranche(s) of the co-financing according to the conditions of Annex No2;

2.2.5 Request the disbursement of the tranche no later than the deadline specified in Annex No2;

2.2.6 To ensure the fulfillment of obligations, within -------- months from the signing of the Contract, encumber the fixed assets (including buildings and/or land plots in which an investment is to be made) created, acquired, arranged, or existing within the framework of the project (if any) with a mortgage or pledge in favor of the RDA, in case of a relevant decision by the committee;

2.2.7 Have in place the proper arrangements to control the use of co-financing for the purposes intended, collect the information regarding the contract performance, regularly review the documents showing the Beneficiary's financial status and business operations, provide unimpeded access to the Beneficiary's buildings, and inspect the storage areas and equipment.

Note *– RDA will determine the frequency and number of inspections. RDA can carry out the inspections without prior notification of the Beneficiary. The inspections can be conducted by either RDA representatives and/or inspectors hired by RDA.*

2.2.8 Upon RDA's request submit to RDA the evidence required to control the co-financing and its use for the purposes intended. The evidence shall be submitted within a time period specified by RDA.

2.2.9 To confirm the performance of the contractual obligations the Beneficiary shall submit an expert's/ auditor's opinion to RDA within the time period specified by RDA in Annex No2. Such an expert/auditor shall be the one registered in the register of the Service for Accounting, Reporting and Auditing Supervision of the Ministry of Finance of Georgia.

***Note**: The expert/auditor's opinion confirming the fulfillment of the purpose must necessarily contain information about the expense documents and the actual circumstances observed on site, as well as photographs of the completed works;*

2.2.10 Timely furnish to RDA accurate and complete information on the Project implementation (including the employees, the income received as a result of the project activities and the costs incurred);

2.2.11 agree and allow RDA to prepare and publish stories, photographs and videos regarding the co-financed project and the Beneficiary's experience as well as upon RDA's request use the project for demonstration;

2.2.12 allow RDA or a designated third person to carry out the Project monitoring and evaluation activities for 3 years after the Project completion;

2.2.13 After the RDA transfers the funds to the bank account, submit to the RDA a bank-certified payment order/income order within the period specified in Annex No. 2, confirming the transfer of funds to the supplier's bank account(s) as provided in the submitted invoice/agreement;

2.2.14 Participate in trainings conducted within the framework of the program and, if requested, undergo mandatory technical consultation with the relevant consultant of the program.

2.2.15 Grant the RDA or the Ministry of Environmental Protection and Agriculture the right to use the financed facility as a demonstration and training base for the purpose of conducting practical field training for groups of farmers.

2.2.16 Comply with the conditions and prerequisites stipulated by the program and the agreement.

2.2.17 Retain implementation records for a period not less than three (3) years from the completion date of the contract.

2.2.18 Avail all documentation for audit or review by IFAD or any IFAD appointed party for audit purposes.

2. 3. RDA has the right to:

2.3.1 At any time without prior notification check and monitor the use of the co-financing for the purposes intended and the Project progress wither directly or with the help of independent experts and/or

auditors, including (but not limited to) inspecting the Beneficiary's activities on site and review of the documents;

2.3.2 request the Beneficiary to submit the information/documents regarding the co-financing and the Project progress;

2.3.3 Approve or reject the decreased or increased Project costs for the Beneficiary. In case of rejection, the Beneficiary shall adhere to the Project costs stipulated in Annex No1.

2.3.4 terminate the Contract if the Beneficiary fails to perform his/her contractual obligations and recover any amounts previously paid without any further liabilities to the Beneficiary.

2.4 RDA shall

2.4.1 disburse the co-financing according to the present Contract and DiMMA;

2.4.2 Based on the proper performance of the contractual obligations by the Beneficiary disburse the co-financing according to the present Contract and DiMMA provided that the required budget is available at that moment.

3. Beneficiary's Responsibility and Contract Termination

3.1 If the beneficiary violates clause 2.2.1 of article 2 of the agreement, the agency is entitled to terminate the agreement or impose a penalty of 0.05% of the co-financing amount specified in the agreement for each overdue day, but not more than 5,000 GEL for each violation of the clause.
In addition, if the amount of the fee to be charged is 10% of the co-financing of the agency, the agency is entitled to terminate the contract signed between the parties;
3.2 if the beneficiary violates clause 2.2.2 of article 2.2 of the agreement; 2.2.3; 2.2.6; 2.2.7; 2.2.8; 2.2.9; 2.2.10; 2.2.11; 2.2.12; 2.2.13 will be charged 0.05% of the amount of co-financing received for each overdue day, but not more than 5,000 GEL for each violation of the subsection.
In addition, if the amount of the co-funding amount to be charged is 10% of the agency's co-financing, the agency is entitled to terminate the agreement signed between the parties and charge the beneficiary to pay the received co-financing amount and the accrued co-financing. If the additional period expires without results, the agency is entitled to terminate the contract and send a notification to the beneficiary;
3.3 The beneficiary is obliged to pay the full amount of the received co-financing to the agency and the accrued penalty within 30 (thirty) calendar days after receiving the notice of termination of the contract.
3.4 In case of violation of sub-clauses 2.2.4 and 2.2.5 of clause 2.2 of article 2, the agency is entitled to terminate the contract.
3.5 The Agreement may also be terminated:
3.5.1. in case of expiration of the validity period of the agreement;
3.5.2. before the deadline, for any reason, if agreed by the parties;
3.5.3. In other cases provided for by law.

3.6 In case of termination of the contract, the beneficiary is not released from fulfilling the obligations arising from the contract;

3.7 In case of termination of the contract by the Agency, the Agency shall not have any obligation towards the Beneficiary

4. Confidentiality

4.1 During the Contract period and after its completion no party shall disclose and/or share with the third party(ies) any confidential information without the other party's prior written consent/

4.2 The following information shall not be considered confidential: a) information furnished to the state/public agencies and or information which is/will become public according to the law; b) the information the disclosure of which is allowed by the preliminary written consent of the party owning this information or by agreement of the parties; c) the information to be disclosed in the cases specified in the laws including the cases when such information is lawfully requested by the third person(s).

4.3 RAD has the right to use the information on the Beneficiary (co-financed) enterprise at its discretion in its adverting and promotional materials, for marketing and other purposes without the Beneficiary's consent as well as post this information on its web site www.rda.gov.ge.

5. Miscellaneous Provisions

5.1 The provisions of this Contract shall prevail over any other agreement/deals and communication (including e-mails) conducted between the parties before the Contract conclusion.

5.2 Under the Contract, a notification shall be considered executed in case of its delivery in written/electronic form/via telephone hotline. The notification must be delivered to the parties by courier, registered letter, or e-mail to the address/e-mail address specified in the Contract. A sent electronic notification shall be considered delivered to the recipient unless the sender of the notification receives an automatic notification generated by technical means/software about the failure to send the e-mail and its non-delivery to the recipient.

5.3 The present Contract shall apply to the legal successors and assignees of the parties. However, without RDA's consent the Beneficiary has no right to assign any of his/her obligations or rights to a third person.

5.4 The addresses and contact details specified in the Contract may be changed; in such case, the parties shall provide written notification within 5 (five) working days from the change.

5.5 The failure of one of the parties to exercise their rights under the Contract shall not be construed as a waiver of such right.

5.6 If at any time any provision of this Contract is considered invalid, it shall not affect the validity of the other provisions or the Contract as a whole.

5.7 All the annexes constitute an integral part of this Contract.

5.8 The costs of registration in the LEPL Service Agency of the Ministry of Internal Affairs and LEPL – National Agency of Public Registry and the notarial costs shall be paid by the Beneficiary.

5.9 All the disputes arising from this Contract shall be resolved amicably by the parties. If the parties fail to do so within 30 days from the rise of the dispute, the dispute will be resolved in the court of law of Georgia.

5.10 The Contract shall enter into force from the date of its signing and shall be valid until the fulfilment of the contract conditions by the parties.

5.11 The parties shall abide by IFAD policies and standards as follows:

- *IFAD's Policy on Preventing Fraud and Corruption in its Activities and Operations* available at www.ifad.org/en/document-detail/asset/40738506;
- *IFAD's Policy to Preventing and Responding to Sexual Harassment, Sexual Exploitation and Abuse* available at www.ifad.org/anticorruption_policy;
- *IFAD's Anti-Money Laundering and Countering the Financing of Terrorism Policy* available at www.ifad.org/en/document-detail/asset/41942012; and
- *IFAD's Social, Environmental, and Climate Assessment Procedures (SECAP)* available at https://www.ifad.org/en/secap

5.12 The present Contract is executed in triplicate – each copy having the same legal force and kept by the signing parties (one copy is given to the Beneficiary and two copies to RDA). All the correspondence regarding the Contract shall be conducted in Georgian.

Bank Details and Signatures of the Parties

RDA	Beneficiary
Non-commercial legal entity – **Rural Development Agency (RDA)** Registration code 404923785 Address: No 6 Marshal Gelovani Ave, Tbilisi, 0159, Georgia E-mail: contact@arda.gov.ge Treasury Single Account _____ **Director/Deputy**	LLC/sole proprietor --------registration No/ID No ---------- Address: ---------- Bank ---------- Bank code : ---------- Account No ---------- _____ **Director**

Annex No 1

Project Cost and the List of Fixed Assets

1. The project cost is GEL ----------

2. Sources of Project financing:

Capital Investments by Types

Fixed assets	Quantity
Total Cost of Fixed Assets	GEL

Note: If any

Other Tangible Assets and Capital Investments	GEL
Total cost	

Annex No 2

pre-conditions of the co-financing (tranche) disbursement and evidence of its use for the intended purposes intended

The number of tranches and their amounts – 1 tranche after full and proper completion of the project by Beneficiary.

Preconditions for disbursement – project performance completed by Beneficiary according to the conditions of this contract and submission of the expert/auditor's opinion confirming the fulfillment of the purpose, expense documents and the actual circumstances observed on site, as well as verification of the completed works as per clause 2.2.9. and its note of this contract.

Deadlines for Confirming the Targeted Spending of the Tranche

Deadlines for Confirming the Fulfillment of Obligations

Deadlines for Performing Other Operations (if any)

Annex No 3

Farm Standards for Primary Milk Production

Here are the 5 key principles to consider when designing an animal barn:

1) **Location and Infrastructure**

   i. The barn should be located away from populated areas to avoid discomfort to residents due to noise, odor, dust, and chaotic movement associated with farming. (Recommended distance: 300 meters from settlements, highways, and railways; 50 meters from internal roads - sanitary zone);

   ii. Availability of internal roads, easy and unrestricted access to power supply, water, and natural gas points (if needed), and proximity to feed production areas are also important factors when selecting the construction site.

   iii. Additional areas for structures such as silage trenches, feed component storage, milking parlor, and manure storage should be considered during the design phase.

2) **Animals' Comfort - Animals should be provided with sufficient space, quality feed, unlimited clean water, comfortable resting places, clean air, and lighting.**

   i. **Feed and Water:** Every animal on the farm should have access to high-quality feed of appropriate composition and unlimited clean drinking water 24 hours a day.

   ii. **Lighting**: Each animal needs a day-night rhythm. If the animal is in the barn during the day, the interior lighting should correspond to daylight and be comfortable for both the animal and the working personnel.

   iii. **Air**: Both the animals in the barn and the working personnel should have unrestricted access to clean air.

   iv. **Resting Place**: Animals should have the opportunity and desire to lie down and rest comfortably in their designated area for as long as they wish: 12-14 hours, especially for dairy cows. There

should be no stressful situations in the barn, either from each other or caused by caregivers/personnel.

v. **Space and Floor**: Each animal should have the ability to move comfortably within the building and have sufficient space to move around. The floor should be comfortable, dry, and well-drained to eliminate the risk of slipping.

vi. The animal barn should be clean and meet general zoo-hygienic standards.

3) **Expandability - Plan your livestock barn so that you can expand it as desired in the future with minimal intervention and cost.**

i. Simplicity of the building structure is important. The possibility of expanding and enlarging the building as desired should be considered at the beginning of the design phase, without compromising the interior space (lighting and aeration) and functionality of the barn.

4) **Simplicity, Durability, and Cost-effectiveness of Building Construction - Use/create simple, easy, and durable structures that are permanent, comfortable, safe, and require minimal maintenance.**

i. The supporting structure of the barn should be durable and functional. Its service life should be calculated for many years and should be easily maintainable/serviceable.

ii. The construction materials used should be safe, functional, and inexpensive.

5) **Efficient Management - Animal care and housing, feed production and feeding, construction, routine preventive work, manure management, milk management, and general hygiene.**

i. The planning of animal care, housing, and the interior design of the barn building should correspond to the chosen type. The feed components selected and available should be considered for balancing the animal ration. The feeding trough should be easily cleaned to ensure a constant supply of fresh, high-quality feed to the animals, and feeding frequency should also be maintained.

ii. Health: Communicable diseases should be controlled . Necessary preventive measures should be implemented as planned. The interior and exterior of the building should comply with the hygiene standards.

iii. Record keeping is very important for both productivity control and the overall health and genetic improvement control of the herd. When improving breeds, attention should be paid to the characteristics of the breeds selected for introduction.

iv. Manure Management and General Hygiene: The possibility of manure storage should be considered when planning the farm territory, based on the size of the herd. There should be an unrestricted amount of water on the farm, which is one of the main conditions for both general farm and primary product production as well as staff hygiene.

v. Raw Milk Management: A place to store (cool) the produced raw milk before it is transferred to the chilled milk collector should be considered during the design phase. There should be sources of hot and cold water, a functional and easily maintained shelf for milk utensils, and a place to install the milking equipment at the appropriate location.

The minimum standards of livestock farm designing and the mandatory requirements

Wall height and roofing

In view of the hot climate in our country the side walls of the barn (cow shed) should be at least 3-4.5m in case of a flat roof. In case of a pitched roof, the roof slope should be 20-45°. The heights of the side walls depend on the layout, number of rows (two or four) and vary between 3-6m. The number of rows in the barn depends on the number of livestock to be housed. Single-row placement of cows is recommended if their number does not exceed 10 heads. In case of more than 10 cows, the cows should be arranged in two rows in the barn. Considering modern standards, it is generally possible to accommodate up to 50-100 heads of cattle in a two-row arrangement in one barn.

In the case of a two-row barn, cows can be arranged either facing each other (when the animals stand facing each other and the space between them is a feed distribution aisle) or back-to-back (the space between them is a technological aisle).

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_____*Beneficiary*

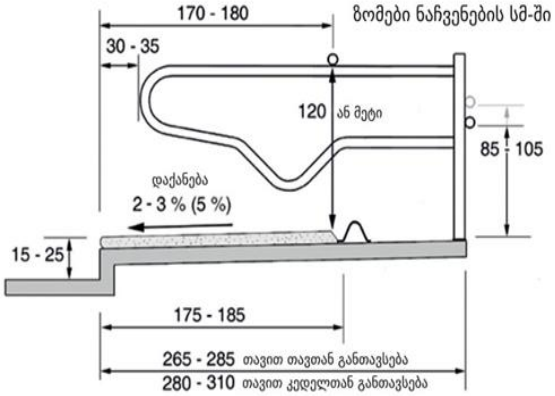
In the case of a triangular roof, it is unacceptable to add a "flat ceiling" for the purpose of a ceiling space, as such an intervention (action) limits the possibility of proper aeration.

When designing the roof, modern standards or the ones close to them should be taken into account to ensure a desirable microclimate in the barn and constant access to shade and fresh air for the animals. This can be achieved by installing ventilation shafts on the roof (one ventilation shaft every 2.5-3 m) or by leaving a 50-60 cm wide opening (ventilation duct) at the highest point of the roof, along its entire longitudinal perimeter, which is covered with a so-called "small roof" to protect the barn from precipitation, or by

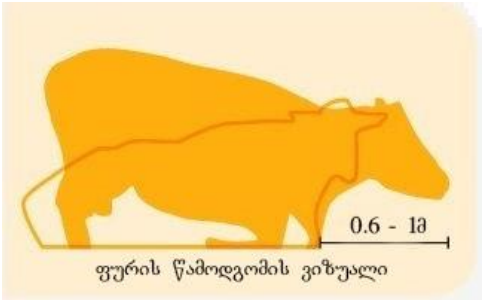
making overlapping roofs with the provision of maintaining the opening. Parameters of the ventilation shaft: 80 cm x 80 cm.

Resting Place

Each animal should have sufficient resting space, with an additional 5% reserve space to accommodate variations in herd size. For example, if the farm is designed for 30 animals, you should place 28 animals in the farm, using the remaining 1-2 spaces as a buffer (maintain these proportions as much as possible). The resting place should be comfortable and pleasant, encouraging the animals to lie down with ease. If the animals lie down on the resting place as soon as they enter the building, it indicates the comfort of the resting area.



To determine the size of the resting place, it is necessary to consider the characteristics of the breeds and the sizes of the cows. The resting place should not be too narrow or too wide. The width is 1.10 - 1.25 m, and the length depends on whether the resting place is located in front of a wall or in front of another resting place (head to head). The length of an adult cow from nose to tail is 170-180 cm. In addition, 65-70 cm should be considered for head movement when getting up, which totals 2.50 - 2.70 m. The slope of the resting place should vary from 2-3.5% towards the movement area or the manure opening.



In the **tethered system**, each cow is placed in a designated place with dimensions: 1.80 m length and 1.0 - 1.2 m width. The animals are tied to the manger by means of a chain. In front of the resting place there is a feeding trough, and behind the resting place is a manure gutter, the width of which depends on the size parameters of the automatic manure removal system, on average the gutter width varies from 35 - 65 cm and the depth is 20-25 cm, determined by the number of animals in the barn.

The dimensions of the stall depend on the live weight of the animals, their breed, age, and gender. Stall (resting place) dimensions for cows of different live weights are given in the table below:

Live weight of an animal, kg	Stall size, cm	
	Length	Width
300 - 350	120 - 125	100 – 105
400 - 500	160 - 170	100 – 110
500 ≤	180 - 200	115 - 120

In case of a **tethered system**, when the animals are placed opposite each other (head-to-head) in two rows, and between these rows is a feed distribution aisle with a width of at least 3 - 4 m, the width of the aisle for the working personnel to access the animals from the wall to the manure gutter should be 1 - 1.5 m.

If cows are placed with their heads towards the wall, the distance between the manger and the wall should be functional, on average 1-1.5 m, so that the working personnel have the opportunity to operate freely.

Resting Place bedding

In modern dairy farms, resting places for cows should be functional and comfortable. Therefore, the beddings of various materials and thicknesses can be used. The beddings are especially important when milking is automated and the cleanliness of cows is a key factor. The turf and sawdust mixture, sand, sawdust, chopped straw, hulls, etc. . High-quality mats; a mixture of peat and sawdust; sand; sawdust; straw, chopped straw, etc. can be used as a bedding.

(*Boards are the best thermal insulator, but their use as a floor covering is permissible only if they are treated with special, safe solutions that minimize the natural absorption capacity of wood.)*

The movement area flooring

The floor should provide a comfortable, sound and durable support. The floor slope should ensure the proper drainage to create a dry surface for movement.

The barn floor should be made of concrete which can be either cut in rhombs to reduce skidding or covered with rubber mats ensuring comfortable movement of animals and preventing their slipping and injuries (in case of a hot climate rubber is not recommended).

The floor slope towards the manure gutter is 1.5-2%.

Movement area and manure disposal

Free movement of animals in the barn is important to avoid injuries, ensure their comfort and rest. The widths of aisles and the proper floor surface will prevent hood diseases (however regular cleaning of hooves is still the best prevention).

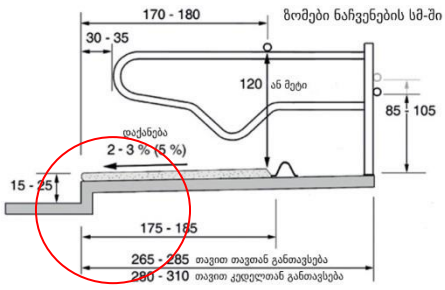
(In case of a free stall barn, it is recommended to install hoof washing baths to prevent hoof disease in animals. The depths of the baths should be estimated according to the hoof height in order to ensure full immersion of hooves. The length of a bath should be sufficient to accommodate all four legs of the animals. The optimum sized hoofs bath is 2.5-3m long, 50-75cm wide and 15-20cm deep).

Manure can be removed from the barn using an automated manure scraper. The installation needs and dimensions of such scrapers should be envisaged in the barn design.

It is also possible to remove manure from the barn using small equipment (push sweeping), and in a small barn, it can be done manually using carts.

The resting place should be 15-20cm higher than the movement area.

Access to the feeding space.



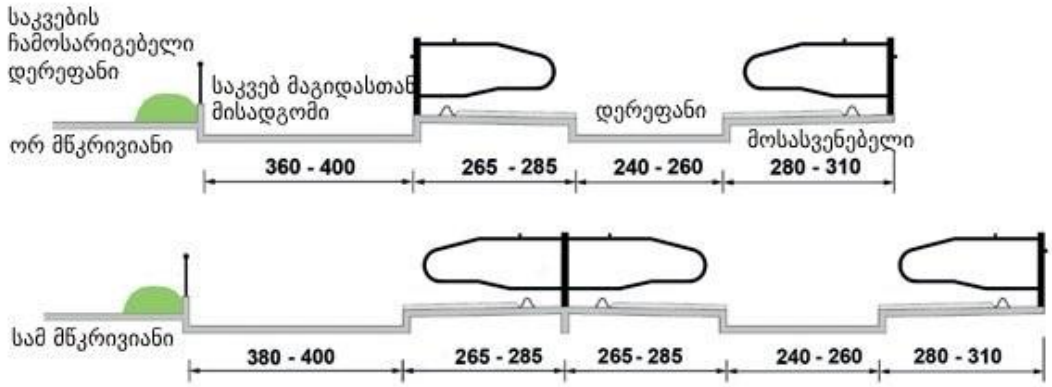
The width of the access place to the feeding trough should be 3.5-4 m, i.e. if one cow is feeding, the other cow should have the opportunity to move around freely. (See Annex #1 - Figure 1) For more comfort, the feeding trough should be on average 15-20 cm higher at the access place.

Feed/feed distribution aisle

The width of the feed distribution aisle should vary from 3.5 to 4.5 m, which provides the possibility of both automatic distribution of feed to livestock and cleanliness of the feeding trough. The height of the feeding trough at the access place should be on average 15 - 20 cm so that the animal has a natural standing (position) when feeding.

The width of the feeding trough in relation to one cow is 70-80 cm, this area ensures greater feed palatability.

To ensure the cleanliness of the feeding trough surface, its surface should be covered with a special paint.



Feed fence/barrier

Along the access place of the animal to the feeding area, a dividing partition (concrete, wood) with a height of 25-35 cm from the floor and a width of 15-20 cm should be arranged, and in the case of a neck barrier, the installation height of the barrier is 1.4-1.45 cm from the floor.

Water and watering

Unrestricted access to clean water has a direct positive effect on the milk yields of livestock.

The recommended water temperature in the barn is 15-20°C, and the water flow rate should be 20 l per minute. A cow drinks water 15 times a day and 10 liters each time.

Appropriate drinkers must be installed on the farm, both in tethered and free-range conditions.

In the tethered system, individual water troughs should be installed directly at the tethering place, at the manger - 1 water trough between 2 cows. The recommended installation height of the water trough is 50-60 cm from the floor (cows drink better from the water troughs if they can immerse their noses in water). The structure of the water trough should be durable, smooth and easy to clean.

Power Supply

Power supply is essential for both lighting and proper operation of all the equipment installed and used in the barn.

Lighting

The proper lighting of a barn is important and has a direct impact on the productivity of livestock.

Two types of lighting can be used: natural (window openings) and artificial (electric lamps). The lighting norm is considered to be 180-200 lux per 1 m² of area.

Lux: (lx, lux) - a unit of measurement for illumination.

1 lux is equal to the illumination of a surface with an area of 1 square meter by a luminous flux of 1 lumen. Lumen: (lm, lm) - a unit for measuring luminous flux.

A 60-watt incandescent lamp creates a luminous flux equal to 710 lumens, a 100-watt incandescent lamp creates a luminous flux equal to 1350 lumens.

Lamp Type	200-300 lumens	300-500 lumens	500-700 lumens
Incandescent lamp (classic, filament lamp)	25-30 watt	40 watt	60 watt
Halogen	18-25 watt	35 watt	50 watt
Compact fluorescent lamp (eco-lamp)	5-6 watt	8 watt	11 watt
LED lamp	2-4 watt	3-5 watt	5-7 watt

The installation height depends on the power of the lamp and the ceiling height in the barn, the higher the ceiling, the more powerful lamps are needed.

It is important that the barn is fully and evenly lit for 16 to 18 hours. Particularly noteworthy is the complete lighting of the feeding trough and milking parlor (if considered).

Aeration/Ventilation

In case of incomplete ventilation of the barn, the productivity of animals sharply decreases, and the general condition worsens not only for the livestock but also for the personnel working in the barn. The temperature in the barn should not exceed +25 degrees and the desired microclimate should be maintained. Cows love a cool environment. For dairy cows, the optimal lower temperature limit is +5°C and the upper limit is +25°C, the most comfortable range is from 7 to +17°C. The relative humidity of the barn should not exceed 70-85%. For regions with a hot climate, it is especially important to have a high ceiling in the barn, ventilation shafts, and even an additional cooling system. The additional cooling system includes both the installation of fans and a water sprinkler system integrated with additional fans (the so-called water shower).

Windows (in case of blind walls)

If the windows are considered as the main source of lighting in the barn, then the window openings should total 8-10% of the floor area. The windows should be openable and easy to clean so that there is no problem with natural lighting if the windows get dirty. The height of windows from the floor to the sill should be at least 1.5 m.

Calving pan

20 days prior to calving, pregnant cows are moved to a comfortable calving pen with unlimited access to clean water and the cleanest, softest and most comfortable flooring possible.

The dimensions of the calving pan are 3 m x 4 m (12 m²). The number of calving pans should be 10-15% of the cows and heifers in the barn.

Young stock housing

During the barn construction special housing for young stock (calves) should be taken into account. The calves should be grouped by ages. Newborn calves should be placed in individual pens for the first two weeks of their lives. Then they can be grouped. Individual pens for calves can be installed either inside or outside the barn.

Milking Parlor and Milking

Automated or mechanical milking requires a special room with a cooling tank for raw milk cooling before its sale or processing.

A milk cooling room should be equipped with drainage shelves, hot and cold-water taps and manure gutters/downpipes.

In case of automatic milking an automatic milking system (AMS) should be selected in advance. Then the milking parlor should be designed and constructed accordingly based on the recommendations of the milking system manufacturer.

5 key conditions for creating the comfortable environment for cows:

1) Dry and soft resting place;
2) Cool, fresh air and appropriate lighting;
3) Unlimited access to high-quality feed;
4) Unlimited access to clean water
5) General hygiene.

Please also note that you are given the freedom to present your own vision and your own design of the barn, considering the basic requirements, so that the presented design is functional, practical, and tailored to the comfort and well-being of the animals and working personnel in it.

- **In Annex 1**, you can find the model of a tethered system barn for 30 dairy cattle, which will help you better understand the given information. (visual example)
- **In Annex 2**, the additional parameters are provided.

(Please carefully read the above 5 main principles to be considered when designing an animal barn and the minimum standards and mandatory requirements for a farm!)

Additional Parameters

(Please carefully read the above 5 main principles to be considered when designing an animal barn and the minimum standards and mandatory requirements for a farm!)

Additional Parameters	
Side wall height of the barn building (for flat and angular roofing)	3m- 4.5m
In case of an angular roofing, the side wall height depends on the number of animals in the barn and the number of rows they are arranged in	3m or more
Roof slope	20° - 45°
Spacing of ventilation shafts	2-3m
Dimensions of ventilation shafts	70/80-70/80cm
Parameters of the resting place in a free stall barn	
Width of the resting place (depends on the size of the animal)	1.1m
Length of the resting place (depends on the size of the animal)	175cm+70cm
Slope of the resting place	2% – 3,5%
Parameters of the resting place in case of tethered system	
Width of the resting place (300-350 kg live weight)	100cm - 105cm
Width of the resting place (400-500 kg live weight)	100cm - 110cm
Width of the resting place (500 ≤ live weight)	115cm - 120cm
Length of the resting place (300-350 kg live weight)	120cm - 125cm
Length of the resting place (400-500 kg live weight)	160cm - 170cm
Length of the resting place (500 ≤ live weight)	180cm - 200cm
Width of the feed distribution aisle	3-4m
Additional Parameters	
Width of the aisle for accessing the animals (technological aisle)	1-1.5m
Width of the access place to the feed table (in case of free stall)	3.5-4m
Installation height of individual water troughs for cows	50-60cm
Installation height of individual water troughs for young stock	40-50cm
Minimum installation height of windows from the floor	1.4-1.5m
Width of the manure gutter (depends on the number of animals in the barn)	35 – 65cm

Depth of the manure gutter (depends on the number of animals in the barn)	20-25cm

Annex 1

Model of a 30-head dairy cow tethered system barn that was widely spread in Scandinavian countries.

The barn with dimensions of 28.5x12.0 m (Figure 1) has walls made of lightweight construction (sandwich panels) with a wall height varying between 3.5 - 4 m. The walls are mounted on a foundation around the entire perimeter of the barn. The walls are provided with windows and ventilation ducts for proper air inflow.

The front and rear walls of the barn are also made of sandwich panels with openings for easily openable-closable doors with a width of 4 m, which ensures free movement of small farm equipment on the barn territory. Ventilation openings are provided along the entire perimeter of the roof ridge.

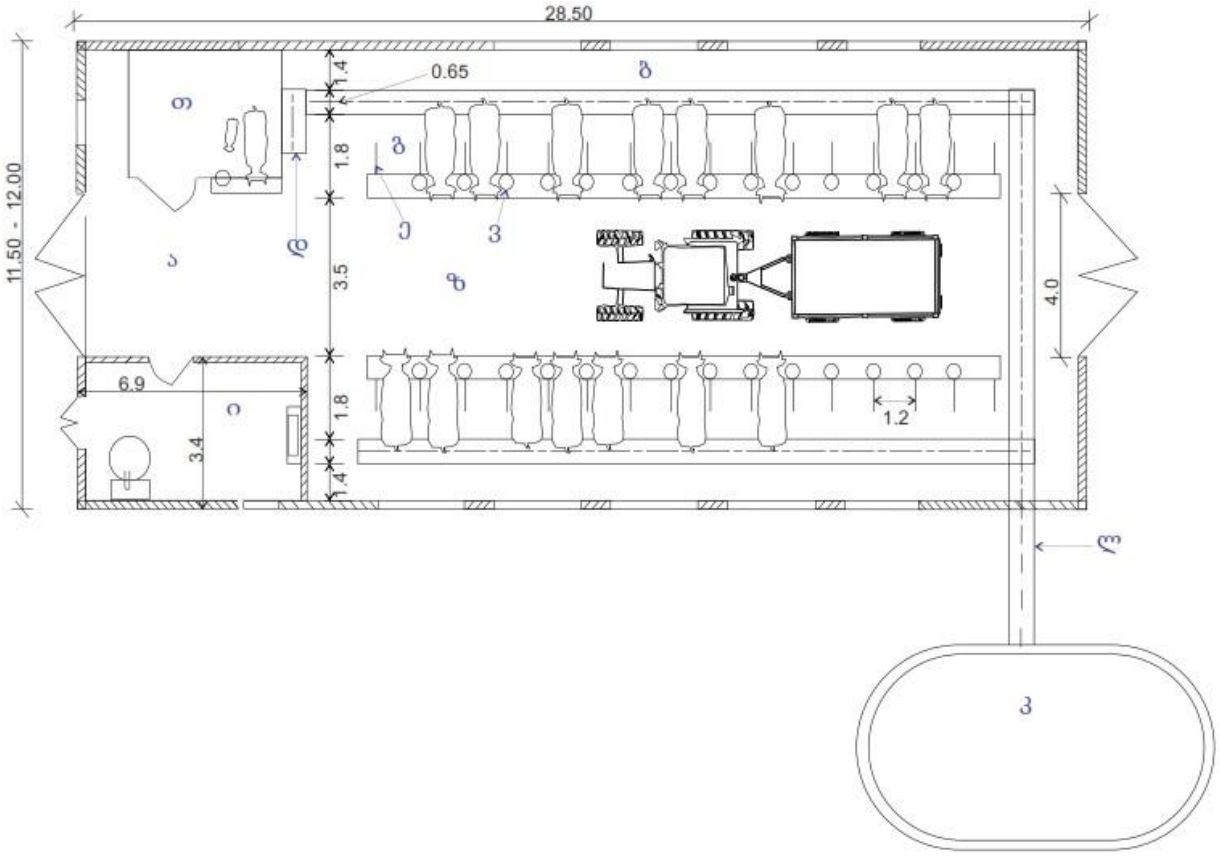


Figure 1: a - plan of a 30-head tethered system barn. c - stall; e - dividers; f - feed distribution area/feeding trough; g – calving pan; h – milking parlor; b - technological aisle (personnel movement area); j - external manure storage of the barn; i - group automated water troughs; d - manure gutter; k - transverse manure gutter.

Inside the barn, the dimensions of the stall (c) are as follows: length 1.75 - 1.80 m, width 1.2 m. Metal п-shaped metal dividers (e) are placed on both sides of the stall. A metal feed barrier is installed in front of the stall, which prevents the possible crossing of the animal to the feed distribution area/feeding trough (f).

At the back of the barn, a manure collection gutter (k) is made with a depth of 0.20 - 0.25 m and a width of 0.65 m (the width of the gutter is determined by the parameters of the automatic manure removal system). The surface of the resting place is made of a mixture of concrete and expanded clay, which is covered with a rubber mat (mat thickness 30 mm). The surface slope is 2% towards the manure gutter.

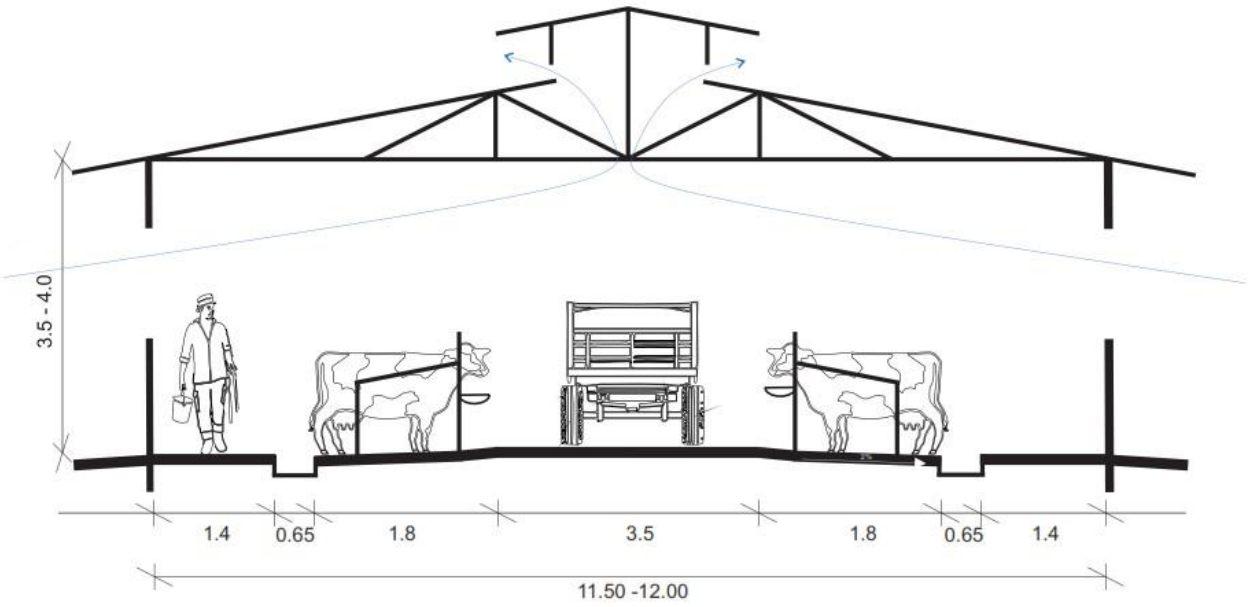


Figure 2: The side section of the barn

The feeding area/feeding trough with a width of 3.5 m is made of reinforced concrete and has a slight depression trough at the resting place near the mouth (barrier). A mobile feed distributor moves in the feeding area, distributing feed to the tethered livestock on both sides. A manure removal system is installed in the manure gutter, which ensures the transfer of manure to the transverse manure gutter at the end of the barn, which has a depth of 0.60 m and a width of 0.65 m. The transverse gutter is covered with metal ribbed hatches. Through the transverse gutter, manure flows out of the barn and accumulates in the manure storage.

Cows are milked in the barn with a milk pipeline. The milk flows through a specialized milk line to the milk colling room and is collected in the milk cooling tank.