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# STUDY ON THE MANAGEMENT OF TECHNOLOGICAL FLOW IN BEEF CATTLE FARMS IN THE NORTH-EAST REGION OF MOLDOVA

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***Abstract***

*This study investigates the management practices and technological processes within beef cattle farms in the North-East region of Moldova, focusing on six distinct farms. Analyzing data from these farms, encompassing a total of 1838 cattle, revealed notable disparities in animal stock, labor force, and forage cultivation areas. Additionally, diverse housing systems, waste disposal methods, and breeding practices were identified. Noteworthy results include Farm F5's effective waste management strategies and Farm F6's adoption of advanced breeding techniques. These findings underscore the necessity of tailoring management approaches to individual farm contexts to optimize operational efficiency and productivity. By providing actionable insights, this research contributes to ongoing efforts aimed at improving beef cattle farming practices in the region and fostering sustainable agricultural development.*

***Key words****: Aberdeen Angus, bovine husbandry, livestock management.*

## INTRODUCTION

Livestock farming, a vital component of the agricultural sector, plays a significant role in boosting rural incomes at both macroeconomic and microeconomic levels (Upton, 2004).

The downturn in this sector has been influenced by several issues, including a reduction in animal numbers, climate variations affecting both breeds and fodder production, and European legislation concerning animal health (Grigoras, 2016; Popescu, 2017; Popescu, 2014; Sterie & Chetroiu, 2021, Nica & Vidu, 2023).

The practice of cattle husbandry serves as a cornerstone in upholding nutritional equilibrium and propelling agricultural and food sectors on a global scale (Velea, 2012). The Aberdeen Angus breed, distinguished for its exceptional marbling and tenderness attributes, stands as an exemplar of high-quality beef production (Gociman et al., 2020; Manea, 2022), representing a substantial 70% share of the global beef cattle population (Maciuc et al., 2015; Țenu, 2023). In the Northeast region of Moldova, characterized by a convergence of historical, cultural, and natural richness, cattle rearing flourishes, especially with breeds well-suited to local conditions such as the Aberdeen Angus.

This study focuses on beef cattle management in Moldova's North-East region, encompassing Botoșani, Iași, and Vaslui counties. Despite the region's agricultural dominance, there's room for improving cattle productivity. The study aims to enhance performance and economic efficiency in beef cattle farming, considering rearing and utilization systems.

Various cattle breeds, including those specialized in milk and meat production, coexist in the region (Vidu et al., 2014) While many breeds have adapted well, there's scope for enhancing productivity. Effective farm management is essential for optimizing outcomes, necessitating managers to stay abreast of industry advancements from diverse sources.

This study seeks to unlock the full potential of beef cattle farming in Moldova's Northeast, leveraging its rich agricultural heritage and fostering sustainable practices for future prosperity.

## MATERIALS AND METHODS

This study aimed to investigate various aspects of cattle farming across the N-E region of Romania. Specifically, we focused on six farms located in the counties of Botoșani, Iași, and Vaslui.

The farms were selected based on specific criteria including geographical diversity, establishment year, rearing system, etc.

The farms included in this study (Table 1) were chosen to represent a diverse range of locations and operational characteristics. Farms were identified through a combination of online databases, agricultural directories, and local government records. The selection criteria prioritized farms with a significant presence in their respective communities, ensuring a representative sample of the region's cattle farming industry.

Table 1. Studied Farms Overview

| Farm | Township | County | Year of Establishment | Area (ha) | Number of Taurines | Rearing System |
|---|---|---|---|---|---|---|
| **F1** | Prăjeni | Botosani | 2015 | 25 | 28 | Semi-intensive |
| **F2** | Ibăneşti | Botosani | 2008 | 90 | 139 | Extensive |
| **F3** | Cozmeşti | Iasi | 2009 | 360 | 280 | Semi-intensive |
| **F4** | Ţigănaşi | Iasi | 1996 | 8500 | 433 | Intensive |
| **F5** | Banca, | Vaslui | 2016 | 80 | 103 | Semi-intensive |
| **F6** | Târzii | Vaslui | 2018 | 5000 | 850 | Intensive |

Data collection was conducted through a combination of online research, direct communication with farm owners or managers, and on-site visits.

Rearing systems were categorized into three main types: semi-intensive, extensive, and intensive. The semi-intensive system involved moderate levels of input, including partial confinement and supplemental feeding, whereas the extensive system relied primarily on grazing with minimal intervention. In contrast, the intensive system utilized high levels of input, including full confinement and controlled feeding regimes.

To ensure the accuracy and reliability of the collected data, multiple verification measures were employed. This included cross-referencing information obtained from farm records with official agricultural statistics and conducting on-site visits to confirm reported data. Any discrepancies or inconsistencies were addressed through further investigation and consultation with farm personnel.

## RESULTS AND DISCUSSIONS

### Geographical Characteristics of the Studied Farm

The investigation into the six distinct cattle farms situated across the N-E region of Romania sheds light on the geographical diversity and agricultural landscapes characterizing each area (Table 2).

Table 2 Regional Characteristics of Studied Farms

| Farm | Township | County | Description |
|---|---|---|---|
| **F1** | Prăjeni | Botoşani | Favorable climatic conditions conducive to semi-intensive rearing. |
| **F2** | Ibăneşti | Botoşani | Optimal conditions for extensive cattle grazing. |
| **F3** | Cozmeşti | Iaşi | Rich agricultural heritage and diverse farming activities. |
| **F4** | Ţigănaşi | Iaşi | Expansive farmlands and intensive farming practices. |
| **F5** | Banca | Vaslui | Fertile valleys ideal for semi intensive cattle grazing. |
| **F6** | Târzii | Vaslui | Expansive agricultural lands and diverse farming practices. |

Situated in the north-eastern part of Romania, F1 is nestled within the picturesque township of Prăjeni, located in Botoșani County. This region is renowned for its lush green pastures and favorable climatic conditions, making it conducive to cattle farming. The fertile soils and ample rainfall contribute to the abundant growth of nutritious forage, essential for the sustenance of the semi-intensive rearing system practiced at F1.

Farm F2 is situated in Ibănești, Botoșani County, which shares similar geographical

characteristics with Prăjeni. The region boasts expansive grasslands and vast open spaces ideal for extensive cattle grazing. Ibănești benefits from a temperate climate and ample sunshine, providing optimal conditions for the flourishing of extensive farming practices.

Cozmești, Iași County is home for F3. The region is renowned for its rolling hills and fertile plains, providing an idyllic setting for agricultural pursuits. The broader region of Cozmești is characterized by its rich agricultural heritage and diverse farming activities.

Iași County is the location of F4 to, within the township of Țigănași. This region is distinguished by its expansive farmlands and well-developed infrastructure, reflecting its long-standing history of agricultural prominence. The fertile soils and favorable climate support intensive farming practices, facilitating the high-density cattle production observed at F4.

The region where F5 is located is characterized by its undulating terrain and fertile valleys, providing an ideal environment for semi-intensive cattle grazing. Banca benefits from abundant rainfall and moderate temperatures, creating optimal conditions for the thriving of semi-intensive farming systems.

Situated in Vaslui County, F6 is nestled within the scenic township of Târzii. The region is known for its expansive agricultural lands and diverse farming practices. The broader region of Târzii is celebrated for its rich agricultural traditions and commitment to sustainable farming practices.

## Feeding Methods, Waste Management, and Cattle Care in Studied Farms

The feeding methods, waste management practices, and cattle care strategies employed in the studied farms exhibit a diverse range of approaches tailored to the specific needs and resources available in each county (Table 3).

Table 3 Feeding Methods and Care Practices Across Studied Farms

| Farm | Feeding Methods | Waste Management | Cattle Care |
|---|---|---|---|
| **F1** | Semi-intensive grazing | Regular removal and proper disposal | Regular monitoring of health and wellbeing |
| **F2** | Extensive grazing | Rotational grazing practices | Regular health assessments and preventive measures |
| **F3** | Semi-intensive grazing | Regular removal to maintain cleanliness and hygiene | Adequate care inferred based on general practices |
| **F4** | Intensive feeding | Systematic removal and disposal | Comprehensive care, including health monitoring and vaccination |
| **F5** | Semi-intensive grazing | Rotational grazing to prevent overgrazing | Prioritization of cattle welfare, including access to water and shelter |
| **F6** | Intensive feeding | Systematic removal and disposal | Meticulous care, including regular health assessments and disease prevention |

In **F1**, a semi-intensive feeding system is implemented. Cattle are provided with a balanced diet consisting of a combination of grazing and supplementary feed. This approach ensures adequate nutrition while leveraging natural forage resources.

Dejections are managed through regular removal and proper disposal. Efforts are made to minimize environmental impact by utilizing waste management practices that prevent contamination of soil and water sources (Evans et al., 2019; Pykälä, 2019).

Cattle receive attentive care, with regular monitoring of health and wellbeing. Veterinarian services are utilized as needed to address any health issues promptly.

**F2** employs an extensive feeding system, emphasizing grazing on open pastures. Cattle have access to abundant forage resources, supplemented with minimal concentrated feed as necessary (Fernando et al., 2010; Khafipour et al., 2011; Russell & Rychlik, 2001).

Dejection management involves natural decomposition processes facilitated by rotational grazing practices (David et al., 2023). This approach enhances soil fertility and minimizes the need for external waste removal.

Cattle health and welfare are prioritized, with regular health assessments and preventive measures in place to mitigate disease risks (da Silva et al., 2006). Attention is given to ensuring

adequate nutrition (NASEM, 2016) and access to clean water (NASEM, 2000).

Considering the geographical location and climatic conditions of **F3**, a combination of grazing and supplementary feeding is employed to sustain cattle throughout the year (Figueiredo et al., 2007; Cazzuli et al., 2023).

The approach to waste management involves regular removal of dejections to maintain cleanliness and hygiene within the premises. Proper disposal methods are implemented to prevent environmental pollution (Chaudary et al., 2018).

Cattle receive adequate care, with attention to their nutritional needs (Olson et al., 2021), and overall wellbeing.

**F4** implements an intensive feeding system to meet the nutritional requirements of a larger cattle population. This involves a combination of grazing, silage, and concentrated feed to optimize growth and productivity (Lahart et al., 2020).

Given the scale of operations, waste management practices include systematic removal and disposal of dejections to prevent accumulation and maintain hygienic conditions (Chaudary et al, 2018).

Cattle receive comprehensive care, with regular health monitoring, vaccination protocols, and nutritional management strategies in place to support optimal growth and performance.

Similar to F1, **F5** employs an semi-intensive feeding system, allowing cattle access to open pastures for grazing. Supplementary feeding is provided during periods of limited forage availability.

Waste management practices involve rotational grazing to prevent overgrazing and soil degradation. Dejections decompose naturally, contributing to soil fertility (Aliyev, 2022).

Cattle welfare is prioritized, with measures taken to ensure access to clean water, adequate shelter, and veterinary care as needed (Nalon et al., 2021).

In **F6**, the intensive feeding system is implemented to support a substantial cattle population. This involves the provision of high-quality concentrated feed to meet nutritional demands, without relying on pasture-based grazing (Doyle et al., 2023).

**Age Distribution of Cattle: Implications for Farm Management and Productivity**

Each farm implements distinct rearing systems and management practices tailored to their specific operational objectives and environmental conditions, consequently influencing the age distribution of their cattle population (Table 4). This variability in rearing approaches reflects the diverse strategies employed by farmers to optimize productivity, animal welfare, and sustainability within their respective contexts.

Table 4. Distribution of Cattle by Age Across Studied Farms

| Farm | Adult Cattle (over 18 months) | Yearlings (12-18 months) | Calves (0-12 months) | Total Cattle |
|---|---|---|---|---|
| **F1** | 14 | 9 | 5 | **28** |
| **F2** | 95 | 40 | 36 | **171** |
| **F3** | 160 | 80 | 40 | **280** |
| **F4** | 120 | 105 | 209 | **434** |
| **F5** | 50 | 29 | 24 | **103** |
| **F6** | 752 | 18 | 80 | **850** |

F1 maintains a **semi-intensive** rearing system. The majority of its cattle population comprises animals aged over 18 months, representing 50% of the total herd. Additionally, 32.14% of the herd consists of yearlings (12-18 months), while the remaining 17.86% comprises calves (0-12 months). With a moderate number of taurines (28), F1 may focus on selective breeding to enhance genetic traits conducive to semi-intensive rearing systems (Otoikhian et al., 2022). Breeding decisions likely prioritize traits that improve adaptability to local conditions and optimize meat production efficiency. Given the small herd size, feeding regimens on F1 is more easily tailored to individual animal requirements, ensuring adequate nutrition for optimal growth and development. Close monitoring of animal health is feasible on this farm, allowing for timely intervention and disease control measures. Collaboration with local veterinarians may be integral to maintaining herd health.

Considering the specific characteristics of F1, including its semi-intensive rearing system, distribution of cattle by age, and management practices, There was conducted a SWOT analysis to assess its strengths, weaknesses, opportunities, and threats (Table 5).

Table 5. The SWOT Analysis of F1

| STRENGTHS | WEAKNESSES |
|---|---|
| 1. **Focus on selective breeding** for genetic enhancement, contributing to the improvement of desirable traits in the cattle population.<br>2. **Ability to tailor feeding regimens** to individual animal needs due to a moderate herd size, ensuring optimal nutrition and growth.<br>3. **Close monitoring of animal health** facilitated by the manageable scale of operations, allowing for timely intervention and disease control measures. | 1. **Limited economies** of scale due to the relatively small herd size, potentially hindering efficiency and profitability compared to larger-scale operations.<br>2. **Dependence on local resources and infrastructure**, which may limit access to specialized services and technologies available in larger farming operations.<br>3. **Vulnerability to market fluctuations and external factors** due to a smaller market presence and limited bargaining power. |
| **OPPORTUNITIES** | **THREATS** |
| 1. **Expansion of the cattle herd** through strategic breeding programs and targeted investment in herd management practices, leveraging the farm's existing strengths in selective breeding and individualized feeding regimens.<br>2. **Diversification of revenue streams** by exploring alternative markets or value-added products derived from cattle production, such as organic or specialty beef products.<br>3. **Collaboration with local agricultural institutions, veterinarians, and industry stakeholders to access resources, expertise, and market networks, enhancing the farm's competitive position and resilience.** | 1. **Intensifying competition** from larger-scale operations or industrialized farming practices, posing challenges to market differentiation and profitability.<br>2. **Regulatory changes or policy developments** impacting agricultural practices, environmental standards, or animal welfare regulations, requiring adaptation and compliance measures.<br>3. **Environmental and climatic risks**, such as extreme weather events or natural disasters, affecting pasture quality, animal health, and overall farm productivity. |

F2 adopts an **extensive** rearing system. The distribution of cattle by age is relatively evenly spread, with approximately 22.22% of the herd aged 0-12 months, 23.39% aged 12-18 months, and 54.39% aged over 18 months. With a larger herd size (171 cattle), F2 has the potential to implement more sophisticated breeding programs aimed at improving genetic traits relevant to extensive rearing systems (Brito et al., 2021; Berry, 2022). Emphasis may be placed on traits such as maternal instincts, foraging abilities, and environmental adaptability. The extensive nature of this farm requires strategic grazing management and supplementary feeding practices to ensure adequate nutrition across a larger herd size and varying pasture conditions. Vigilant disease surveillance and vaccination protocols are essential for maintaining herd health and preventing disease outbreaks in extensive grazing systems.

Analyzing the SWOT of F2's extensive rearing system reveals key insights into its operational dynamics and strategic considerations (Table 6).

Table 6. The SWOT Analysis of F2

| STRENGTHS | WEAKNESSES |
|---|---|
| 1. **Focus on extensive rearing system**, leveraging larger herd size for potential economies of scale.<br>2. Relatively **even distribution of cattle by age,** facilitating diverse breeding programs and genetic enhancement.<br>3. Emphasis on genetic traits **relevant to extensive grazing systems, such as maternal instincts and environmental adaptability.** | 1. **Potential challenges in managing a larger herd size**, including grazing management and supplementary feeding practices.<br>2. **Dependency on pasture conditions and environmental factors**, which may affect nutrition and overall herd health.<br>3. **Limited capacity for individualized care** and monitoring due to larger scale of operations. |
| **OPPORTUNITIES** | **THREATS** |
| 1. **Exploration of alternative markets** or value-added products derived from extensive rearing practices.<br>2. **Collaboration with industry stakeholders and experts** to optimize grazing management and herd health protocols.<br>3. Adoption of advanced technologies and management practices **to enhance efficiency and productivity.** | 1. **Intensifying competition** from larger-scale operations, posing challenges to market differentiation and profitability.<br>2. **Environmental and climatic risks**, such as droughts or extreme weather events, impacting pasture quality and herd health.<br>3. **Regulatory changes or policy developments** affecting agricultural practices and environmental standards. |

Farm F3 employs a semi-intensive grazing system, managing a total of 280 cattle. The distribution by age reflects strategic management practices. Approximately 57% of the herd consists of adult cattle over 18 months old, while 29% are yearlings aged 12-18 months. Calves aged 0-12 months make up the remaining 14%. F3's focus on rearing taurines suggests a commitment to breeding programs geared towards meat production. Genetic selection may prioritize traits such as growth rate, feed efficiency, and carcass quality (Brito et al., 2021; Berry, 2022). With a significant land area (280 ha), Farm F3 likely benefits from ample pasture resources, supporting extensive grazing and minimizing the need for supplementary feeding during the grazing season. Proximity to local veterinary services may facilitate regular health checks and disease management protocols, ensuring the well-being of the herd.

The SWOT analysis (Table 7) provides a comprehensive overview of F3's, shedding light on key factors influencing its operational dynamics and strategic decision-making.

Table 7. The SWOT Analysis of F3

| STRENGTHS | WEAKNESSES |
|---|---|
| 1. **Utilization of semi-intensive grazing system**, optimizing land resources and supporting extensive grazing practices.<br>2. **Majority of the herd comprised of adult cattle**, reflecting strategic breeding programs and emphasis on meat production.<br>3. Proximity to local veterinary services**, facilitating regular health checks and disease management protocols.** | 1. **Limited data availability**, potentially hindering comprehensive analysis and decision-making.<br>2. **Relatively high proportion of adult cattle**, which may increase vulnerability to market fluctuations and production risks.<br>3. **Dependence on natural pasture resources**, subjecting the herd to environmental variability and seasonal fluctuations. |
| **OPPORTUNITIES** | **THREATS** |
| 1. **Exploration of alternative breeding strategies and genetic selection criteria** to enhance meat production efficiency and carcass quality.<br>2. **Implementation of innovative grazing management practices** to optimize pasture utilization and minimize supplementary feeding requirements.<br>3. Collaboration with industry experts and research institutions **to access specialized knowledge and resources for herd management.** | 1. **Market volatility and unpredictable economic conditions**, impacting demand for meat products and farm profitability.<br>2. **Environmental risks**, such as droughts or disease outbreaks, affecting pasture quality and overall herd health.<br>3. **Regulatory changes or policy developments** affecting agricultural practices and land management policies. |

F4, operates an intensive rearing system. The majority of its cattle population is concentrated in the age group of 12-18 months, accounting for 60% of the total herd. Cattle aged over 18 months represent 30% of the herd, while the remaining 10% consists of younger animals aged 6-12 months. As one of the largest farms with an extensive herd (433 taurines), F4 may invest in advanced breeding technologies and genetic selection methods to enhance productivity and profitability in an intensive rearing system (Brito et al., 2021; Berry, 2022). Intensive production on F4 necessitates precision feeding programs to meet the nutritional requirements of a large herd and optimize feed efficiency. The scale of operations on F4 requires robust health management protocols, including routine vaccinations, biosecurity measures, and disease surveillance to minimize health risks and maintain herd productivity (Doyle et al., 2023).

Following the detailed analysis of each farm's operations, the SWOT analysis (Table 8) was applied to elucidate the keys inherent in their respective management strategies and environmental contexts.

Table 8 The SWOT Analysis of F4

| STRENGTHS | WEAKNESSES |
|---|---|
| 1. Extensive herd size**, providing economies of scale and potential for increased production efficiency.**<br>2. Concentration of cattle in the 12-18 months age group**, facilitating standardized management practices and targeted breeding programs.**<br>3. Potential for investment in advanced breeding technologies and genetic selection methods **to optimize productivity and profitability.** | 1. **Limited diversity in age distribution**, with a relatively small percentage of younger animals aged 6-12 months, potentially limiting flexibility in breeding and production strategies.<br>2. **High reliance on intensive rearing practices**, which may entail increased resource inputs and management complexity.<br>3. **Vulnerability to market fluctuations and external factors** due to the large-scale nature of operations and dependence on specialized inputs. |
| **OPPORTUNITIES** | **THREATS** |
| 1. Adoption of innovative technologies and management practices **to enhance productivity, efficiency, and sustainability.**<br>2. Diversification of product offerings or market channels **to mitigate risks associated with market volatility.**<br>3. Collaboration with industry stakeholders and research institutions **to access resources, expertise, and market networks, fostering innovation and competitiveness** | 1. **Regulatory changes or policy developments** impacting intensive farming practices, environmental standards, or animal welfare regulations, necessitating adaptation and compliance measures.<br>2. **Exposure to health risks and disease outbreaks**, requiring robust biosecurity measures and proactive disease management strategies.<br>3. **Intensifying competition** from other large-scale producers or industrialized farming operations, potentially affecting market share and profitability. |

Farm F5, follows an extensive rearing system similar to F1. Here, approximately 35% of the herd is aged 6-12 months, 45% is aged 12-18 months, and 20% is aged over 18 months. F5's focus on semi-intensive rearing and a moderate-sized herd (103 taurines) may prioritize breeding for traits such as adaptability to outdoor environments, grazing efficiency, and reproductive performance. Farm F5 operates under a semi-intensive grazing system, managing a total of 103 cattle. The distribution across different age groups is as follows: adult

cattle over 18 months old comprise 48.5% of the total, yearlings aged 12-18 months account for 28.2%, and calves aged 0-12 months make up the remaining 23.3%. Despite the semi-intensive approach, the farm relies primarily on natural forage resources for grazing, supplemented as needed to ensure adequate nutrition and herd health. Regular health monitoring and access to veterinary services remain critical for preventing disease and maintaining optimal herd conditions within the semi-intensive production system.

The SWOT analysis (Table 9) offers a clear evaluation of F5 farm, shedding light on key factors influencing its operational dynamics and strategic positioning.

Table 9. The SWOT Analysis of F5

| STRENGTHS | WEAKNESSES |
|---|---|
| 1. Strategic focus on semi-intensive rearing system**, capitalizing on natural forage resources and outdoor grazing opportunities.**<br>2. Diversified age distribution of cattle**, reflecting flexibility in management practices and breeding strategies.**<br>3. Moderate-sized herd **allows for more personalized care and attention to individual animal needs.**<br>4. Semi-intensive grazing **approach promotes animal welfare and environmental sustainability.** | 1. **Limited economies** of scale compared to larger operations, potentially impacting efficiency and profitability.<br>2. **Reliance on natural forage resources** may pose challenges during periods of scarcity or adverse weather conditions.<br>3. **Moderate-sized herd** may limit bargaining power and market presence, affecting competitiveness.<br>4. **Dependence on external veterinary services and infrastructure** for health management and disease control. |
| **OPPORTUNITIES** | **THREATS** |
| 1. Exploration of value-added products or niche markets **to diversify revenue streams and enhance profitability.**<br>2. Collaboration with local agricultural institutions and industry stakeholders **to access resources, expertise, and market networks.**<br>3. Adoption of innovative technologies or management practices **to improve efficiency, productivity, and sustainability.**<br>4. Expansion of the semi-intensive grazing system **to optimize land use and production potential.** | 1. **Fluctuations in feed costs or market prices** may impact production costs and overall profitability.<br>2. **Regulatory changes or policy developments** affecting agricultural practices, environmental standards, or animal welfare regulations.<br>3. **Environmental and climatic risks**, such as droughts or extreme weather events, affecting pasture quality and animal health.<br>4. **Intensified competition from larger-scale operations or industrialized farming practices**, potentially squeezing profit margins and market share. |

Lastly, F6 operates an intensive rearing system, with a majority of its cattle population aged 12-18 months, comprising 88.5% of the total herd. Cattle aged over 18 months represent 8.5% of the herd, while those aged 6-12 months constitute the remaining 3%. With a significant herd size of 850 taurines, F6 has the capacity to implement comprehensive breeding programs aimed at maximizing meat production efficiency and genetic potential in an intensive rearing system. Intensive production on Farm F6 requires precise nutritional management, with formulated diets tailored to meet the specific needs of different age groups and production stages. Rigorous health monitoring protocols, disease prevention measures, and access to veterinary expertise are essential for ensuring the well-being and productivity of the large herd on F6 (Doyle, 2023).

An analysis of Farm F6's SWOT (Table 10) provides valuable insights into its current position and future prospects within the intensive cattle rearing sector.

Table 10. The SWOT Analysis of F6

| STRENGTHS | WEAKNESSES |
|---|---|
| 1. Extensive experience in intensive cattle rearing**, leveraging knowledge and expertise accumulated over time.**<br>2. Large herd size **provides economies of scale and potential for increased production efficiency.**<br>3. Capacity to implement sophisticated breeding programs **aimed at enhancing meat production efficiency and genetic potential.**<br>4. Robust health monitoring protocols and access to veterinary expertise **ensure optimal herd health and productivity.** | 1. **Reliance on intensive rearing methods** may increase operational costs and resource requirements.<br>2. **Limited flexibility in grazing management** due to the scale of operations and infrastructure constraints.<br>3. **Potential challenges in managing a large herd**, including disease control, nutrition, and environmental impact.<br>4. **High initial investment and ongoing maintenance costs** associated with intensive production systems. |
| **OPPORTUNITIES** | **THREATS** |
| 1. **Expansion into value-added products or niche markets** to capitalize on consumer preferences for premium beef products.<br>2. **Strategic partnerships with local agricultural institutions or industry stakeholders** to access resources, expertise, and market networks.<br>3. **Adoption of innovative technologies and practices** to improve operational efficiency and sustainability.<br>4. Diversification of revenue streams through complementary activities such as agro-tourism or renewable energy production. | 1. **Market volatility and fluctuations in input costs** may impact profitability and financial stability.<br>2. **Regulatory changes or environmental policies** affecting intensive farming practices or land use.<br>3. **Competition from other livestock producers or alternative protein sources** may erode market share and pricing power.<br>4. **Environmental risks** such as climate change, natural disasters, or disease outbreaks could disrupt operations and supply chains. |

The distribution of cattle by age varies significantly across the studied farms, influenced by factors such as rearing system, management practices, and regional characteristics.

## CONCLUSIONS

The study provides valuable insights into the complexities of cattle farming practices in northeastern Romania. By elucidating key aspects of farm management, breeding programs, feeding and nutrition strategies, and health management, our study contributes to the broader body of knowledge on livestock production systems. These insights can inform decision-making, policy development, and future research aimed at advancing the sustainability and productivity of cattle farming in Romania and beyond.

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