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Commercial Dairy Farming Enhance Rural and Urban Livelihoods

[1]Mohammad Abdur Rahman Nuri, [*2]Md. Jahangir Alam, [3]Md. Abdullah Al Zaber, [4]Israt Jahan Promy and [5]Md Bashir Uddin

[1, *2, 3]Department of Animal Production and Management, Sher-e-Bangla Agricultural University, Dhaka, Bangladesh.

[4]Department of Poultry Science, Sher-e-Bangla Agricultural University, Dhaka, Bangladesh.

[5]Department of Medicine, Sylhet Agricultural University, Sylhet, Bangladesh.

Abstract

This study explored the impact of commercial dairy farms on the livelihood development in both rural and urban areas of Dhaka District, Bangladesh. The research was conducted in two selected locations: Khilgaon Thana (urban) and Keranigonj Upazila (rural), with data collected from 60 commercial dairy farms—30 from each area. Structured interviews were conducted from August to October 2019 to assess various socio-economic, production, and marketing parameters. The findings reveal that the majority of the farm owners were male, with urban owners generally older than their rural counterparts. Most farmers had primary-level education, and a significant portion managed small to medium-sized families. Urban farms averaged 8 animals, while rural farms had 12, with Friesian crosses being the predominant breed. Artificial insemination was the primary breeding method in both settings. The cost of rearing per cow per day was higher in urban areas (Tk.165) compared to rural areas (Tk.120), but returns were also higher in urban settings (Tk.330 vs. Tk.235). Despite challenges such as high feed costs, disease prevalence, and limited access to veterinary services, commercial dairy farming was found to significantly contribute to income generation, employment, and improved living standards. Marketing of milk differed notably between urban and rural farmers, with urban producers relying more on direct consumer sales and rural farmers engaging with local vendors and cooperatives. Overall, the study concludes that commercial dairy farming holds considerable promise for enhancing rural and urban livelihoods and recommends policy support, better market access, and veterinary infrastructure to sustain this growth.

Keywords: Dairy farming, livelihood development, rural and urban areas, income generation, Dhaka, Bangladesh.

Introduction

Dairy farming is a key agricultural activity in Bangladesh, contributing significantly to the country's economy, rural employment, and food security (Chowdhury *et al*., 2018). The livestock sector employs approximately 85% of the population either directly or indirectly (Ahmed *et al.*, 2023). Among dairy animals, cattle play the most prominent role, followed by buffalo and goats. According to Bangladesh Bureau of Statistics (Samad, 2020), there are about 23.78 million cattle, 1.47 million buffaloes, and 3.34 million goats in the country. Out of six million milking cows, 85–90% are indigenous and only 10–15% are crossbred, predominantly Sindhi, Sahiwal, and Holstein Friesian breeds (Datta *et al*., 2019; Samad, 2020).

Milk production in Bangladesh remains largely dependent on cows, accounting for approximately 90% of total output, with goats and buffaloes contributing 8% and 2%, respectively (Datta *et al.*, 2019). Between 2005 and 2016, annual milk production reached 3.97 million tons, with an average annual growth rate of 13.5%. Despite this growth, domestic production remains insufficient to meet national nutritional demands. The dairy sector is predominantly composed of smallholder farmers who maintain 1–3 cows per household and produce 70–80% of the country's total milk (Datta *et al*., 2019; Uddin *et al*., 2020).

Commercial dairy farming offers a viable pathway to enhance productivity, increase rural and urban income, and address malnutrition. It is regarded not only as a business but also as a full-time livelihood that involves continuous care, management, and labor input throughout the year (Ahmed *et al.*, 2023; Jubaedah *et al*., 2024). In this context, milk is a high-demand commodity with substantial income-generating potential, particularly for marginal and small-scale farmers. The profitability of dairy farming can be improved by focusing on breed enhancement, efficient feeding, disease management, and market accessibility (Samad, 2020; Khan *et al*., 2024; Sultana *et al*., 2024).

Livelihood improvement through commercial dairy farming has been documented across developing countries, including Bangladesh. It plays a pivotal role in reducing rural poverty, providing year-round employment, improving nutrition, and generating additional income streams through the sale of by-

***Corresponding Author:** mjalam.apma@sau.edu.bd

products like cow dung and urine (Uddin *et al*., 2017; Chowdhury *et al*., 2018). Family labor is often utilized for farm operations, which increases household involvement and minimizes costs (Ahmed *et al*., 2016).

However, commercial dairy farmers face several constraints. These include high feed and veterinary costs, limited access to quality inputs and services, poor infrastructure, and lack of training and technical knowledge. Such barriers hinder productivity and profitability. Addressing these challenges is essential to realize the full potential of the dairy sector (Hafeez and Rahman, 2014; Uddin *et al*., 2020).

This study was undertaken to evaluate how commercial dairy farming impacts the livelihoods of farm owners in both urban and rural areas of Dhaka District. By comparing socio-economic conditions, income levels, and utilization of dairy by-products, the study aims to provide a comprehensive understanding of the benefits and limitations associated with commercial dairy farming.

Materials and Methods

This study employed a cross-sectional research design to assess and compare the socio-economic impacts of commercial dairy farming in urban and rural areas of Dhaka District, Bangladesh. Two purposively selected sites were chosen based on the density of commercial dairy farms: Khilgaon Thana representing the urban area, and Keranigonj Upazila representing the rural area.

A total of 60 commercial dairy farms were surveyed, comprising 30 from Khilgaon and 30 from Keranigonj. The selection of farms was stratified by geographic area and randomized within each stratum to ensure representativeness. Only farms maintaining at least five dairy cows were included in the study to ensure commercial-level operations.

Primary data were collected between August and October 2019 using a structured questionnaire. The questionnaire was pre-tested and refined prior to administration and covered key areas such as demographic information, herd size and composition, housing and feeding practices, breeding and health management, milk production and marketing, income levels, and utilization of by-products like cow dung and urine. In-depth face-to-face interviews were conducted with farm owners or managers to gather comprehensive information.

Secondary data were also obtained from institutional sources such as the Department of Livestock Services (DLS), Bangladesh Bureau of Statistics (BBS), and relevant published literature to supplement and validate primary data.

Data processing included coding, tabulation, and entry into Microsoft Excel for analysis. Descriptive statistics such as frequency distributions, percentages, means, and cost-benefit ratios were calculated to assess trends and differences between urban and rural farms. Comparative analyses focused on assessing variations in farm practices, productivity, and economic outcomes across the two study areas.

The methodological approach ensured robust data collection and analysis to evaluate the developmental contributions of commercial dairy farms to the livelihoods of farmers in both urban and rural settings.

Results and Discussion

The age distribution showed that urban farm owners were predominantly between 41–50 years (60%), whereas rural farm owners mostly fell within the 31–40 age group (47%) (Table 1). The majority of respondents in both areas were male (urban: 96.7%, rural: 73.3%), married, and had attained primary education (urban: 43.3%, rural: 50%) (Figure 1). Rural families were notably larger, with 63.3% having more than seven members compared to 10% in urban areas (Figure 2). Most urban farmers (86.7%) were exclusively engaged in dairy farming, whereas rural farmers (83.3%) combined dairy with crop agriculture (Figure 3). This age difference may reflect varying motivations and capacities for engaging in farming activities in urban versus rural settings. These demographic factors influence the type of agricultural activities pursued, with urban farmers focusing more on dairy farming, while rural farmers often combine dairy with crop agriculture (Ibrahim *et al*., 2020).

Table 1: Age distribution of respondents

Age (years)	Frequency		Percentage	
	Urban	Rural	Urban	Rural
21-30	1	4	3.33	13.33
31-40	7	14	23.33	46.67
41-50	18	9	60.00	30.00
51-60	4	3	13.34	10.00
Total	30	30	100	100

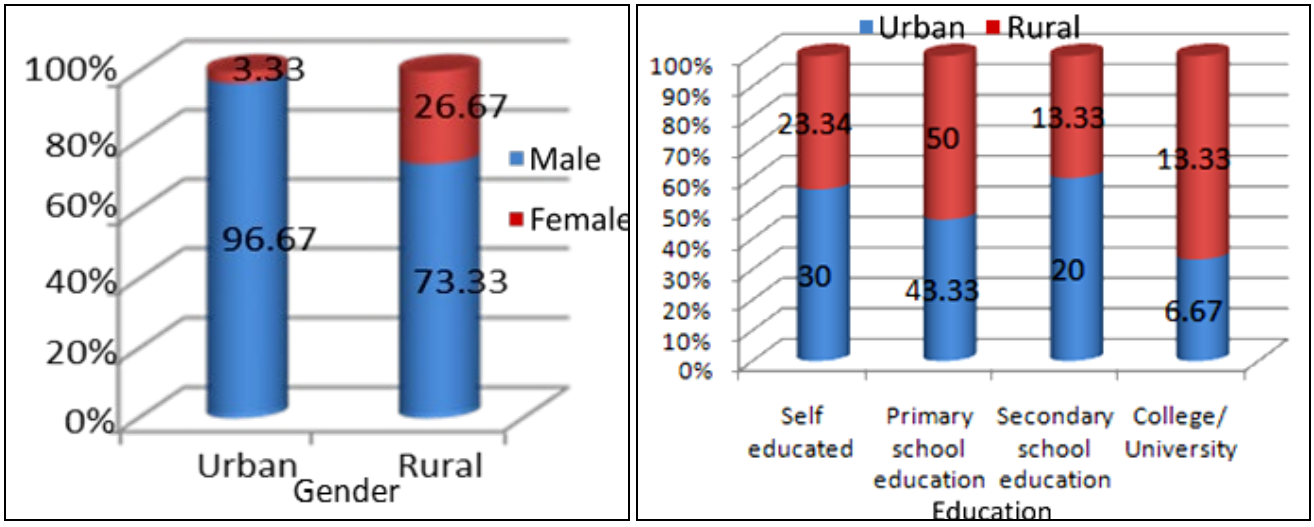

Fig 1: Gender and education levels

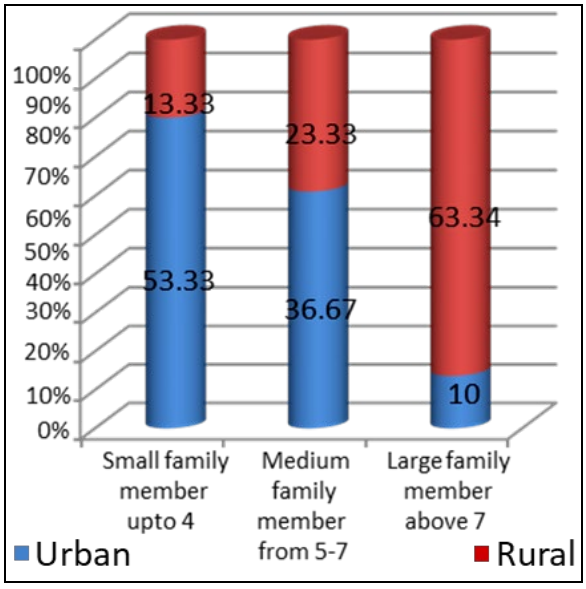

Fig 2: Family size distribution

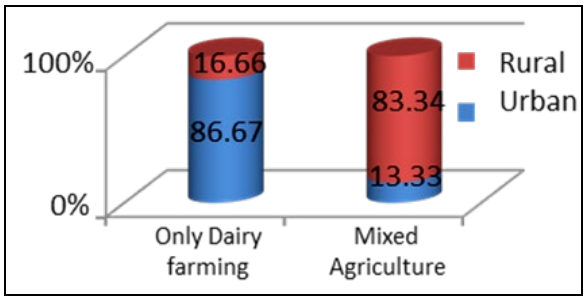

Fig 3: Occupational status of farmers

Urban farms maintained an average of 8 cows, while rural farms averaged 12. Friesian crossbreeds dominated both regions (urban: 83.3%, rural: 66.7%), followed by Jersey cross and indigenous breeds. Artificial insemination was practiced by over 90% of respondents in both groups (Figure 4). Urban farms typically purchased fodder (80%), while rural farms practiced in-farm fodder production (83.3%), reflecting better resource use and land availability in rural settings (Figure 5). Urban and rural dairy farming practices exhibit distinct characteristics influenced by their respective environments. Urban farms primarily purchase fodder, while rural farms benefit from in-farm fodder production, reflecting the greater land availability and resource use efficiency in rural settings. These differences highlight the adaptation of dairy farming practices to urban and rural constraints and opportunities (Reichenbach *et al*., 2021; Kumar *et al*., 2024).

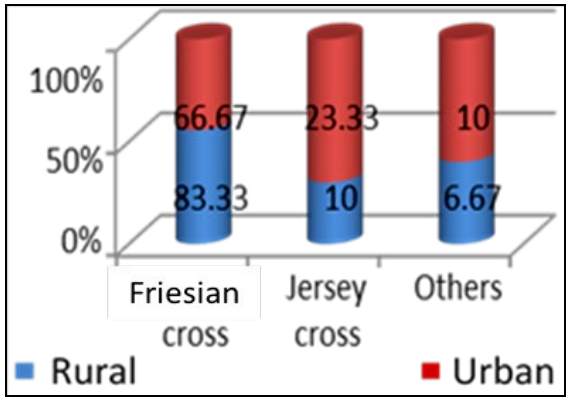

Fig 4: Breed types and breeding practices

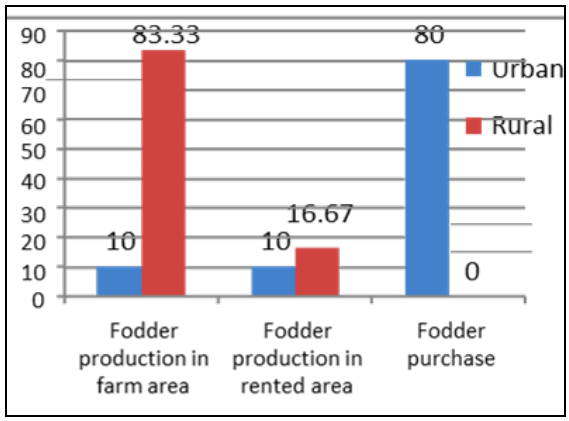

Fig 5: Fodder sourcing and feed practices

Daily milk yield and economic return were higher in urban areas, where the rearing cost was Bangladeshi Tk.165/cow/day and income was Tk.330/cow/day. In rural areas, the cost was Tk.120/cow/day, with income of Tk.235/cow/day, yielding a cost-benefit ratio of 1:2 in both contexts. Monthly net income per cow averaged Tk.5000 in urban and Tk.3500 in rural farms. Milk production per cow annually ranged from 1500 to 2500 liters, with a slight edge to urban farms (Figure 6). The economic performance of dairy farming in urban and rural areas shows distinct differences in terms of costs, income, and productivity. Urban dairy farms tend to have higher daily milk yields and economic returns compared to their rural counterparts. The cost-benefit ratio remains consistent across both urban and rural settings, indicating that while costs are higher in urban areas, the returns are proportionately greater, leading to similar profitability ratios (Pinto *et al*., 2021; Hafeez & Rahman, 2014; Uddin *et al*., 2020).

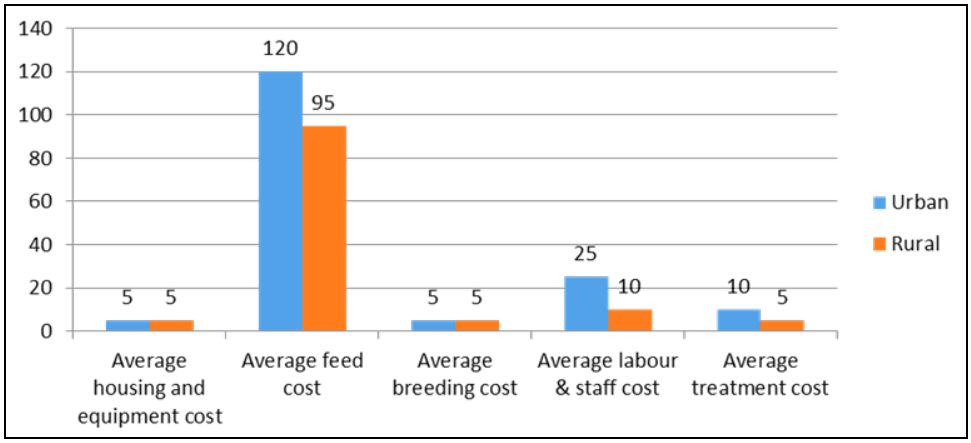

Fig 6: Cost and income comparison per cow

Major constraints in urban farms included disease incidence (43.3%) and high feed costs (26.7%), whereas rural farmers cited lack of technical knowledge (26.7%), market access, and limited veterinary services as primary barriers (Figure 7). These constraints align with earlier studies emphasizing the need for enhanced extension services and input availability to ensure productivity (Shamsuddin *et al*., 2006; Sultana & Hossain, 2023; Alam *et al*., 2024; Hazrana & Mishra, 2024; Dompreh *et al*., 2024). Urban and rural farming face distinct challenges that impact their productivity and sustainability. Urban farms often struggle with disease incidence and high feed costs, while rural farmers face barriers such as lack of technical knowledge, market access, and limited veterinary services. These constraints highlight the need for improved extension services and input availability to enhance productivity, as emphasized in previous studies. The following sections delve into the specific challenges faced by urban and rural farmers, supported by insights from various research contexts (Teoh *et al*., 2024; Kumar *et al*., 2024).

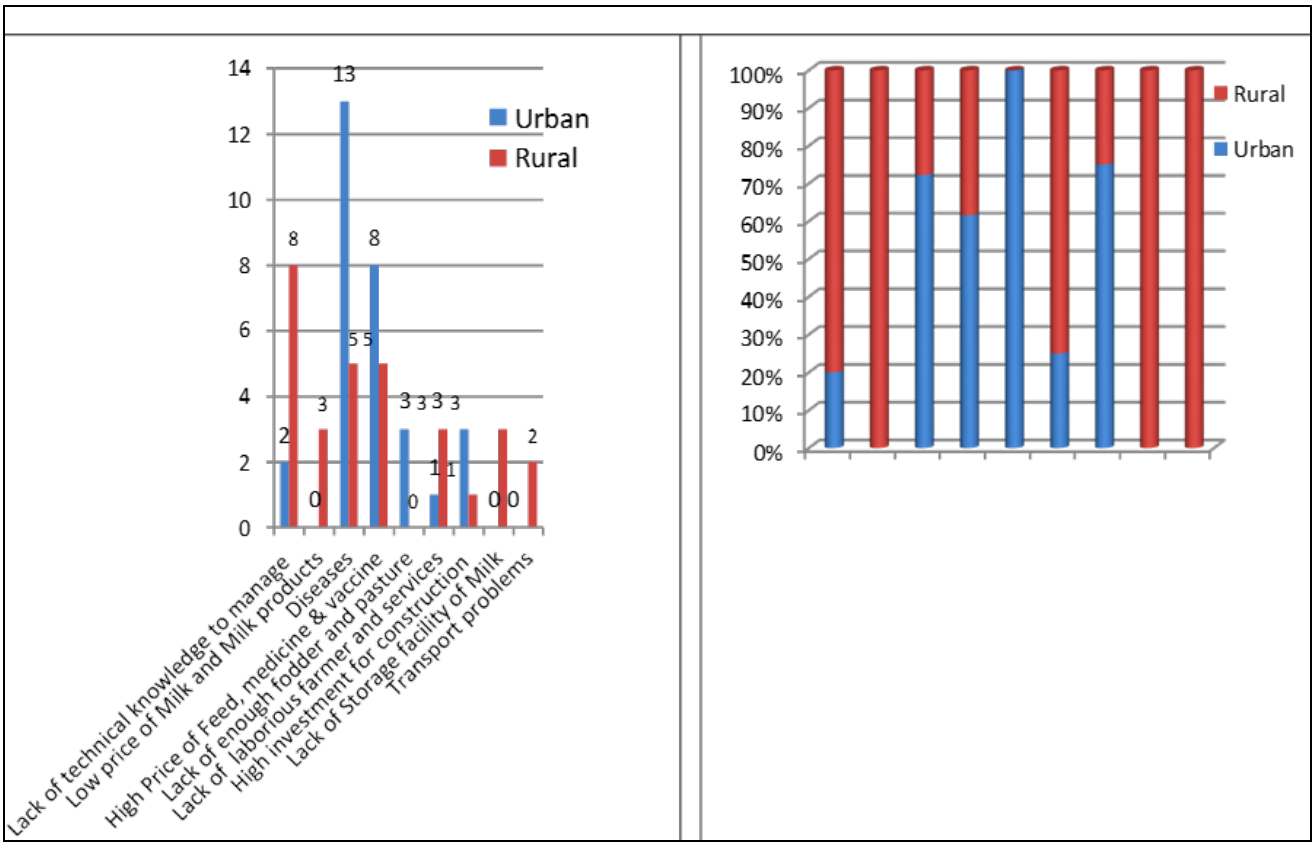

Fig 7: Constraints in commercial dairy farming

Urban farmers primarily sold milk directly to consumers (56.7%), while rural farmers relied more on vendors, sweet shops, and cooperatives (Figure 8). This difference reflects a stronger direct market linkage in urban zones. Cow dung and urine were better utilized in rural areas as fertilizer and biofuel, whereas most urban farms discarded these by-products due to lack of space and infrastructure. Urban and rural dairy farming practices differ significantly in terms of market linkages and by-product utilization. These differences highlight the distinct challenges and opportunities faced by urban and rural dairy farmers (Pinto *et al*., 2021; Reichenbach *et al*., 2021; Uddin *et al*., 2020).

Fig 8: Milk marketing channels by region

Dairy income contributed significantly to household expenses, education, and reinvestment in farming. In urban areas, 53.3% of farmers reported income increases, with 40% expanding their herds. In rural areas, 70% noted income gains, and 76.7% expanded their farms, indicating stronger growth momentum despite lower profit margins per cow (Figure 9). Annual income per cow ranged from Tk.75,000 to Tk.200,000, reflecting variability in scale and productivity (Table 2). Dairy farming plays a crucial role in enhancing household income, supporting education, and enabling reinvestment in farming activities (Islam *et al*., 2017; Uddin *et al*., 2020). The economic impact of dairy farming varies between urban and rural areas. This variability is influenced by factors such as herd size, management practices, and regional differences (Shamsuddoha & Shamsuddoha, 2009; Ahmed *et al*., 2016: Datta *et al*., 2019; Ahmed *et al*., 2023).

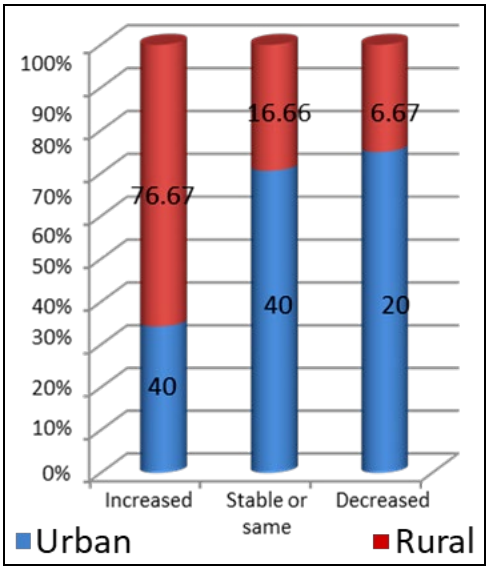

Fig 9: Herd expansion and income improvement trends

Table 2: Average annual income per animal

Average annual income/cow (BDT)	Frequency		Percentage	
	Urban	Rural	Urban	Rural
50000-75000	2	6	6.66	20.00
75001-100000	9	13	30.00	43.33
100001-150000	11	9	36.67	30.00
150001-200000	8	2	26.67	6.67
Total	30	30	100	100

Commercial dairy farming plays a vital role in enhancing rural and urban livelihoods through employment generation, income diversification, and food security. However, sustainability depends on improved access to technical knowledge, feed resources, healthcare, and organized marketing (Pandey *et al*., 2024; Jubaedah *et al*., 2024). Policy interventions should address these gaps while promoting training programs and cooperative models to ensure inclusive growth (Ahmed *et al*., 2023; Misra *et al*., 2023).

Conclusions

This study confirms that commercial dairy farming significantly contributes to improving livelihoods in both rural and urban areas of Dhaka District. Farmers benefit from enhanced income, employment opportunities, and better utilization of dairy by-products. Despite challenges like high feed costs, disease incidence, and limited veterinary services, the profitability and sustainability of commercial dairying remain promising. Urban farmers showed higher productivity, while rural farmers demonstrated greater expansion potential. Strengthening access to technical training, healthcare services, and organized marketing networks is essential. Strategic policy support and infrastructure development can further enhance the sector's role in ensuring food security and economic upliftment.

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