

AMBITIOUS SOLUTIONS FOR ETHIOPIA'S DAIRY CHALLENGES



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SUMMARY

Dairy products are rich in many nutrients essential for healthy growth and development, and they are often more affordable than other animal-source foods. Ethiopia has a very large stock of dairy animals, and milk and other dairy products are popular in the local food culture. Yet the per capita consumption of dairy is surprisingly low, reflecting numerous challenges in production, distribution, and household behaviours.

This Working Paper reviews the experience of GAIN Ethiopia tackling some of these challenges in the dairy value chain. GAIN has developed behaviour change interventions to ensure continuity of consumption of dairy by children through periods of religious 'fasting' and has also developed novel approaches to support schools wishing to provide milk as part of school meal programmes. In Amhara Region, GAIN is supporting dairy retailers and has developed an innovative dispenser to reduce waste and contamination. GAIN continues to experiment with new products and formats that have the potential to reduce costs and has supported the development of a National Dairy Development Strategy.

GAIN's experience shows that it is possible to develop solutions to the seemingly intractable problems of the dairy sector in Ethiopia. However, the low purchasing power of many Ethiopian households continues to hold back consumption of most nutrient-dense foods, and low productivity of traditional livestock systems also results in high prices that are a challenge for many.

KEY MESSAGES

- Dairy products are rich in essential nutrients, yet consumption is low in Ethiopia. This is despite cultural acceptability of dairy and widespread cattle ownership.
- The Ethiopian government and its development partners have invested extensively in improving dairy production, and GAIN has complemented these efforts with interventions focusing on re-shaping cultural norms, supporting the sale of dairy and its provision in schools, and the development and promotion of novel dairy products.
- Much more needs to be done to support the development of the dairy sector in Ethiopia. The development of a National Dairy Development Strategy is an important step in this respect.
- Since challenges in supply and in demand create a negative feedback loop and perpetuate low consumption, efforts must continue to be made on both fronts.

BACKGROUND AND OBJECTIVE

Cattle were domesticated by humans more than 10,000 years ago and continue to be an important source of food and income around the world. In 2023, 16 countries had particularly large stocks of cattle, with more than 20m head of cattle each (1); Ethiopia was ranked number five in this list with over 70m head of cattle. In Ethiopia, dairy is familiar and liked by consumers; milk and its by-products are consumed as fresh milk, yoghurt, cottage cheese, butter, buttermilk and as whey, and beef is consumed both fresh and dried. Yet despite the large number of cows and the variety and cultural acceptability of dairy products, the frequency of consumption of these products is surprisingly low: in 2023, just 27% of the adult population of Ethiopia consumed a dairy product over the previous 24 hours (2). Similarly, according to the Ethiopian Demographic and Health Survey 2019 (3), only around one in five one-year-old children were given dairy over the previous 24 hours.

The reasons for the limited consumption of dairy products in Ethiopia relate to challenges across the entire value chain. Minten and co-workers, discussing the transformation of the dairy sector in Ethiopia (4), have noted that small farms and those in remote areas of the country have suffered from low and stagnating—or even declining—milk yields. While larger commercial producers have benefited from improved inputs and services, the small farms suffer from insufficient and inefficient input and service delivery and high feed prices (5). An absence of cold chain infrastructure and, more recently, interruptions in access to conflict-affected regions of the country, makes aggregation and transport of milk in rural areas extremely challenging. Cultural factors—especially the importance of fasting in the rituals of the Ethiopian Orthodox church, which takes place up to 250 days of the year and prohibits consumption of animal-sourced foods—adversely affect milk consumption (6). Finally and perhaps most importantly, widespread poverty limits households' ability to purchase anything more than the most basic food items.

GAIN in Ethiopia has been working since 2017 to increase the consumption of dairy products, particularly by young children post infancy. GAIN selected this focus for several reasons. First, at the time of project design, cottage cheese and milk were some of the cheapest foods available in Ethiopia to fill key nutrient gaps observed during the complementary feeding period (7). Moreover, multiple bilateral and multilateral donors had invested in the development of the dairy sector in Ethiopia, creating a foundation for further progress. Dairy is also a priority for the Ethiopian government, including featuring prominently in the Seqota Declaration, the country's leading strategy document for the elimination of child undernutrition, and more recently in the national livestock and apiculture initiative *Yelemat Turufat*. Despite these favourable pre-conditions, GAIN and other development partners continue to encounter numerous practical challenges in trying to scale up access to and demand for dairy products.

This working paper sets out to present some of the most significant challenges encountered and the solutions that GAIN has identified to overcome them.

BARRIERS AND SOLUTIONS IN THE ETHIOPIAN DAIRY VALUE CHAIN

CULTURAL BARRIERS

Building on existing knowledge about the cultural barriers to dairy consumption in highland Ethiopia (6), GAIN conducted further formative research in selected

communities in Amhara Region in late 2023. (Amhara Region was chosen because it has a large dairy sector with several previous donor investments in production and processing).

This research revealed that:

1. Pregnant and lactating women rigorously avoid dairy foods (also other animal-source foods) during the 180-250 annual 'fasting' days prescribed by the Orthodox Church. Only the first 10-15 after delivery are exempt from this requirement.
2. Although children under seven are formally exempted from fasting, they very often mimic the behaviour of their older siblings and parents significantly before this age, observing fasting also.
3. Although dairy foods are known to be good for children, caregivers do not perceive any major negative consequence if they are eliminated from their diet. All dairy products are perceived to have the same nutritional value, leading to a preference for family consumption of buttermilk, which is a surplus product after the production and sale of butter.
4. Intra-community sales of milk are extremely limited, at least in part due to traditional beliefs about storage of purchased milk and associations with the continued productivity of the source cow.
5. Goat and sheep milk are not viewed as suitable for human consumption (though this differs across areas of Amhara Region).

The GAIN team developed two complementary interventions to reshape these beliefs and attitudes. The first was a community-level intervention delivered by the Ethiopian Orthodox Tewahido Church Development and Inter-Church Aid Commission (DICAC). DICAC developed a sermon book on dairy consumption and provided Training-of-Trainers for local clergy in 76 districts (*'kebeles'*) to use at home visits, monthly meetings of community savings groups, at Sunday morning sermons, and on other social occasions. The Sunday sermons using the guide alone are estimated to have reached more than one million congregants, and messaging was also aired on the Ethiopian Orthodox Church's dedicated television channel, which reaches up to 12 million viewers.

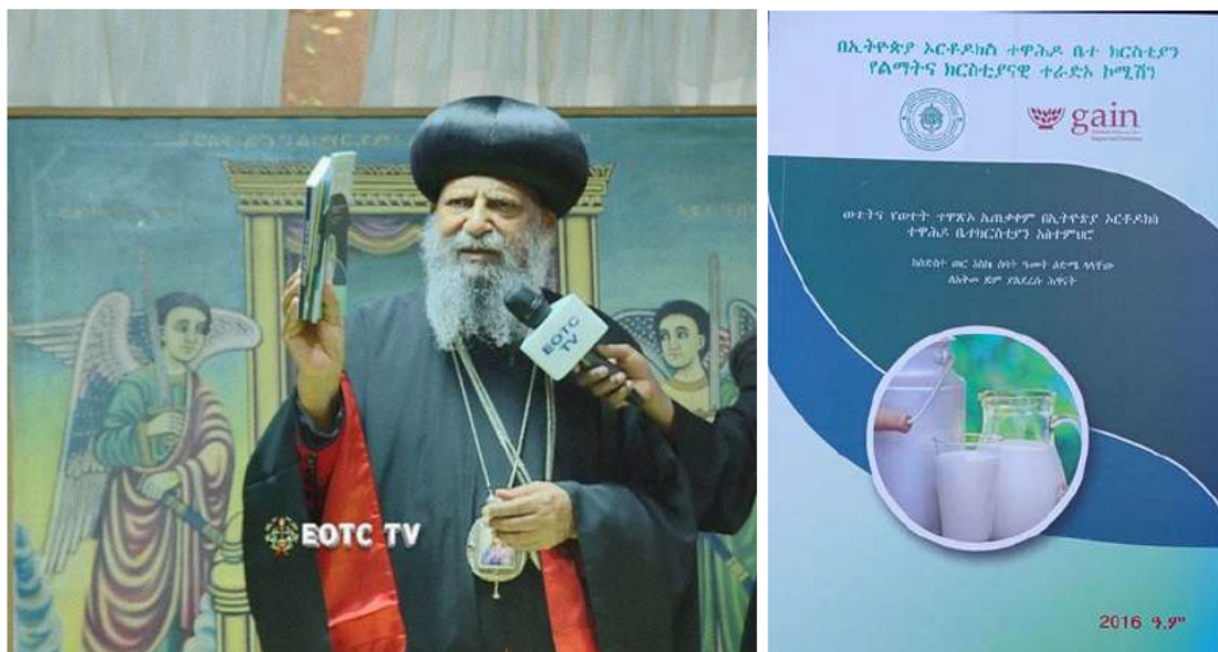
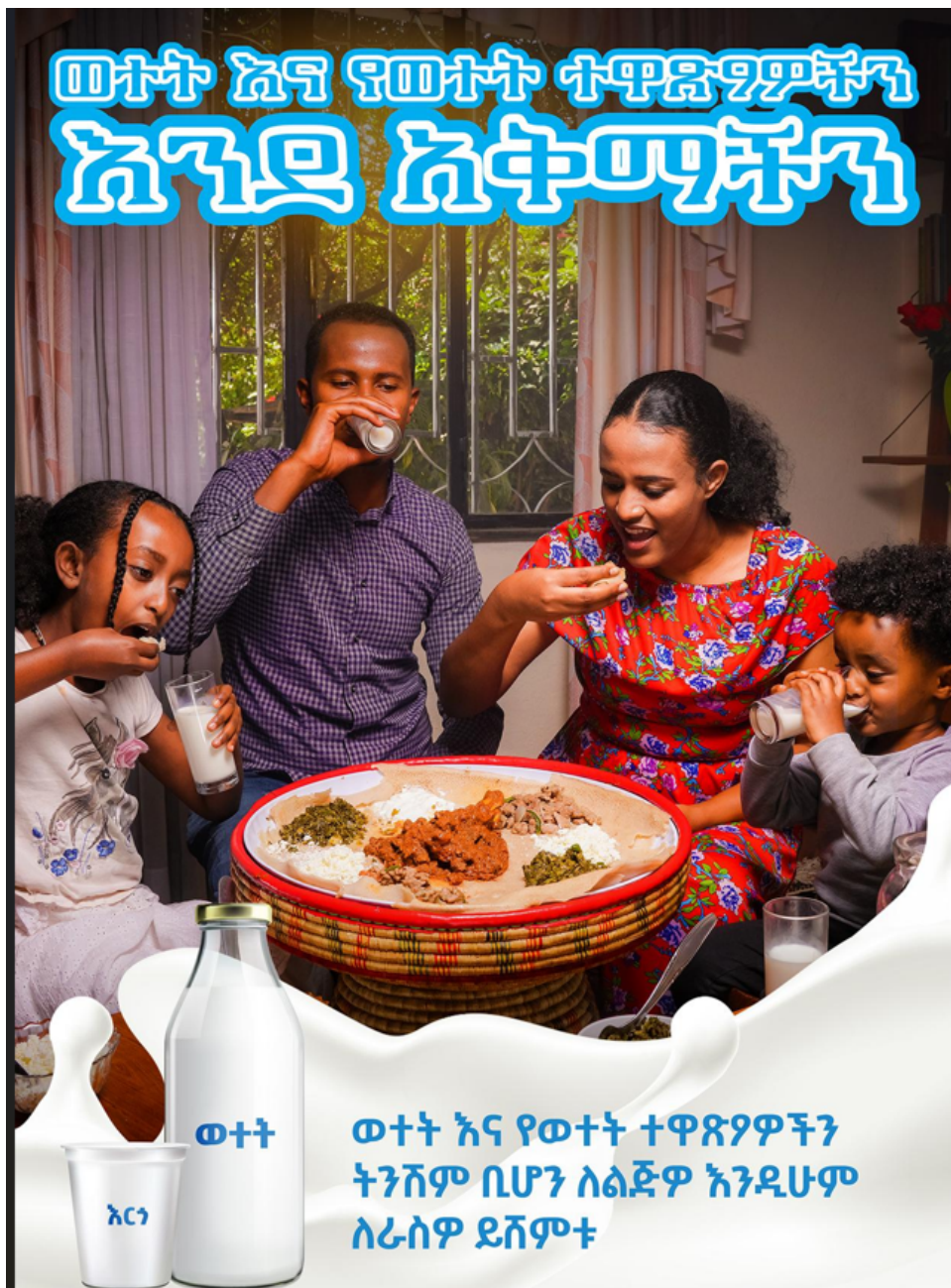


Figure 1. Inauguration of the sermon book on dairy consumption. Photos: DICAC (8)

In collaboration with the Ethiopian communications, advertising, and promotion agency Zeleman, GAIN also developed a communications campaign targeting the whole community - with parents in particular encouraged to feed their children whatever amount of dairy they can afford – under the tagline ‘Dairy, within our capacity.’ The campaign’s stories use a regionally relatable and emotionally compelling voice to reinforce self-efficacy in the face of resource constraints. The campaign implementation includes three radio ads, each in two of the locally spoken languages and accompanied by a jingle. The spots, which have been diffused on stations reaching millions of listeners, focus on the very real affordability challenges which Ethiopian consumers face, as exemplified in the narrative: *‘Every action we take today will influence our children’s future. Let’s nurture our kids and ourselves with milk and dairy products as best we can. Dairy for us and our kids—within our capacity.’*



A visual theme under the same tagline and concept celebrates families that purchase the quantities they can afford. This is shown in the poster at left, which depicts a family enjoying their meal accompanied by a glass of milk each. The same message is repeated: ‘As much dairy as we can’ (*top*) and ‘Buy dairy for yourself and your family even if it is a little’ (*bottom*). Both milk and yoghurt are illustrated as options.

Figure 2. Image from GAIN’s dairy promotional campaign. Image: GAIN.

SCHOOL MEAL PROGRAMMES

GAIN identified schools as an important channel to increase the consumption of milk. For several years, the team followed the progress of the BRIDGE project led by the Dutch non-profit organisation SNV (9), which was working to include milk in school meal programmes. This project initially subsidised the cost of the milk provided in schools, tapering the support in subsequent years. However, SNV found that the school milk provision struggled to survive once the subsidy was removed (10) and switched focus to advocacy for public funding. Other initiatives (for example, the Ethiopian School Meals Initiative and Wondirad School) have tried to establish dairy farms in schools—but neither of these initiatives has found it easy to scale.

Learning from these efforts, GAIN Ethiopia has chosen to avoid ‘blueprint’ solutions and instead use customised Human Centred Design tools (11) to create a menu-based approach that builds on the (hyper-)local context of each school. The approach works with local stakeholders from specific schools and sub-city administrations to: review all possible options for provision of dairy in the school; work through a decision tool to select one business model among 10 models identified that they feel could work in their context; validate that the model selected is actually suitable, and finally develop a full proposal for their selected model including an implementation plan, financial plan, and collaboration strategy. The approach is being tested in Mulugeta Gedlie school in Sheger City.



Figure 3. Brainstorming local solutions for the provision of dairy in schools. Photo: GAIN.

MILK DISPENSING SOLUTIONS

Except in the case where milk or yoghurt is obtained directly from a farmer who has a cow and lives in close proximity to the purchaser, these products must be stored and then dispensed. Maintaining the product at a cool temperature is essential in order to prevent spoilage and health risks to the consumer, but in the current informal market, raw milk is generally sold without refrigeration and without adequate protection from the external environment.



Figure 4. Traditional methods of transporting and selling milk in Ethiopia. Photo: Terefe Taye.

With a view to making safe milk available in high-footfall locations such as Industrial Zones or commercial farms, GAIN investigated the possibility of introducing to Ethiopia automated vending machines ('milk ATMs'), an option that has become widespread in neighbouring Kenya (12) but is unknown in Ethiopia. The assessment found that 80% of milk ATMs in Kenya are assembled locally, but virtually all the parts are imported. Both parts importation and local assembly would pose problems in Ethiopia, where access to hard currency for imports is extremely challenging for most businesses and where there are far fewer qualified technicians. The business case for milk ATMs in Kenya is also supported by the density of milk processors who practice pasteurisation—rarely found in Ethiopia. The erratic nature of the electricity supply in Ethiopia would also be challenging for running and maintaining milk ATMs. Finally, no Kenyan milk ATM model was identified capable of dispensing viscose products such as yoghurt, which is a common way of consuming dairy in Ethiopia.

In light of these results, the team reverted to a simpler concept: adapted milk churns that could pump out chilled milk or yoghurt manually without needing to break the seal. Such a technology could be used in small retail outlets ('milk bars') or in institutional settings such as schools or workplace canteens. A first prototype was generated at a student innovation competition at the Danish Technical University (DTU) in May 2022. The concept was then further refined at a workshop in Addis Ababa with local dairy processors, metal workers, government, and local and international NGOs (see Figure 5). The modified dispenser proved able to maintain a temperature of 4-6° C for 72 hours and prevent bacterial proliferation. The team then worked with the Institute of Ethiopian Standards to develop and approve standard ES 7130:2024, which provides the requirements for portable dispenser equipment for milk and yoghurt. GAIN is piloting a milk dispenser based on the ES 71:30 Ethiopia standard and guidelines with 10 milk retailers in the project area and capturing learnings. This portable milk dispenser not only improves access to the consumer but also avoids the use of the non-recyclable plastic that has a negative impact on the environment.



Figure 5. DTU prototype milk dispenser and workshop on dispenser design in Addis Ababa. Photos: GAIN.

NOVEL DAIRY PRODUCTS

GAIN has attempted to further develop the urban market for dairy products in Ethiopia by supporting market players to develop and market value-added products. The first of these was a fortified flavoured yoghurt aimed at middle-class consumers. GAIN's partner Arla Food Ingredients provided technical assistance to one (initially two) local milk processors in Addis Ababa to develop this product, for which the company was able to obtain the necessary product registration. More recently, GAIN has teamed up with Yoba for Life (www.yoba4life.org), a Netherlands-based social enterprise that has introduced a low-cost probiotic fermented milk product in several African countries. GAIN has worked with Yoba for Life to identify high potential 'milk bars' in a number of provincial towns in Amhara region and to support these small shops with training, business planning, and small grants. Product demonstrations (tastings) have also been carried in in these markets. Both these novel products require local access to highly specialised starter cultures—currently, there is no local production of starter culture in Ethiopia, and importation is also challenging.



Figure 6. Consumers enjoying Yoba for Life’s probiotic drink in Bahir Dar. Credit: GAIN,

NATIONAL DAIRY DEVELOPMENT STRATEGY

In order to create a more conducive enabling environment for dairy in Ethiopia, GAIN supported the Federal Ministry of Agriculture to develop the country’s first National Dairy Development Strategy (13). The strategy, launched in 2023, committed Ethiopia to a 10-year plan to address bottlenecks across the dairy value chain – including cattle, camel, and goat milk. The strategy includes short-, medium-, and long-term plans (up to 2031) covering the entire the dairy value chain starting from input supply, breeding, forage and animal nutrition, extension services, biosecurity and animal health, quality and safety of dairy products, dairy product marketing, investment attractiveness of the sector, climate and environmental management, and alignment with other strategies.

CONCLUSIONS

Ethiopia has made progress over recent decades reducing levels of malnutrition, but over one third of all under-five children remain stunted (3). Consumers, both in urban and rural areas, struggle to access healthy diets because of high food prices and very limited purchasing power. While no single food group can resolve the problems of maternal and child undernutrition, milk and other dairy products are nutrient-dense and are relatively inexpensive sources of key nutrients compared to other locally available nutrient-dense foods. There are huge numbers of cows across the country, and milk and derived products feature prominently in local food culture. Many government and development-partner projects over the years have attempted to strengthen dairy production and consumption, and there are clear signs that progress has been made (4).

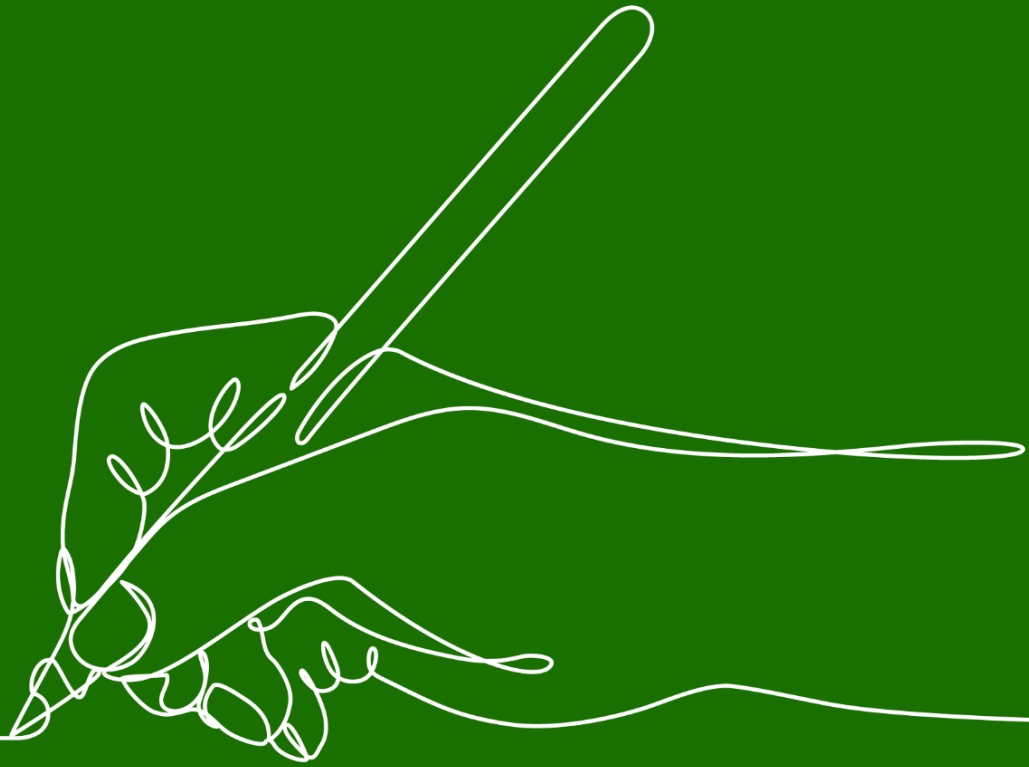
Despite these advances, dairy consumption remains very low. It is hard to separate out the impact of supply-side and demand-side factors. Modern milk processing is sparse largely because there is a huge dip in consumption during the Ethiopian Orthodox Church 'fasting' days, cows cannot be 'switched off' during these periods, and there is no effective long-term dairy preservation infrastructure. Village producers therefore favour longer shelf-life products such as butter, but demand for butter can never rival the impact of daily consumption of milk. Industrial producers would have to divert production to long-life milk, but the capital requirements to produce this are very significant. GAIN has worked at community level to increase the demand for milk and dairy for children and pregnant women, but this segment, while socially important, is small in terms of the total potential market. Paradoxically, where demand is boosted, it immediately hits against a challenge of fulfilling supply. In rural areas, this is partly because yields remain very low, except in a few pockets, and there is little or no culture of inter-household sales. In urban areas, the main challenges are lack of cold chain infrastructure and the absence of pasteurisation (which is expected by authorities in urban areas).

In the absence of huge investments in refrigeration, GAIN has worked on a simple solution for dispensing that has the potential to significantly improve the business model in milk bars, schools, and workplaces. Yoba for Life's probiotic product also reduces the need for cold chain, but the need for imported starter culture is a challenge in a country where foreign exchange is very hard to access.

The experience of the metropolitan area of Addis Ababa suggests that the challenges of the dairy sector in Ethiopia are possible to overcome: milk is widely (if inconsistently) available, traditional beliefs are less rigid, a 'middle class' that can afford to consume dairy is emerging, and local schools and workplaces are beginning to come up with their own solutions for enhancing dairy access. It seems likely that development partners are best advised to try and replicate some of these conditions in secondary cities in the country. Trying to improve rural access directly is likely to be a long play.

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ABOUT GAIN

The Global Alliance for Improved Nutrition (GAIN) is a Swiss-based foundation launched at the UN in 2002 to tackle the human suffering caused by malnutrition. Working with governments, businesses and civil society, we aim to transform food systems so that they deliver more nutritious food for all people, especially the most vulnerable.

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