



# Life-Course Trajectories of Milk Consumption among Young Norwegian Women and their Knowledge of Milk as a Source of Iodine: A Qualitative Study

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## ABSTRACT

By adopting a life-course perspective, this study aimed to investigate milk consumption practices in young Norwegian women and their knowledge of milk contribution to iodine status. Convenience sampling was used to recruit 30 bachelor students (women, 18 to 25 years old) from five different study programs. Interpretative Phenomenological Analysis (IPA) was used to interpret milk consumption practices in a life-course perspective. Five focus group interviews were conducted using a semi-structured interview guide. The transcribed interviews were coded according to emerging themes related to milk consumption practices. Milk consumption trajectories were dynamic and changed over time and were influenced by several factors; family traditions, school milk subscription, friends and social media, availability, price, and attitudes towards health and environment. Young women tend to be in a phase of life in which milk, the main source of iodine in Norway, is not part of their food practices. Most of the women were not aware of the consequences of omitting milk from their diet and had a limited knowledge of iodine. Education of the consequences of omitting milk from the diet should be promoted as well as strategies to assure adequate iodine intake.

**Keywords:** Food practices, Milk, Knowledge of iodine, Young women, Life-course Perspective, Food choice trajectories

## INTRODUCTION

In Norway there is a growing concern regarding decreased milk consumption among young women, since milk is the major source of iodine in the Norwegian population. Young women are especially vulnerable to insufficient iodine intakes, yet little attention has been given to investigating young women's attitudes towards milk, their milk consumption practices, and their knowledge about the

potential health consequences of omitting milk from the diet. By adopting a life-course, this study aims to explore how milk consumption practices change across the lifespan of young Norwegian women, how phases of transition shape their use of milk, and how past experiences interact with their current and future milk consumption practices. Iodine, a critical nutrient in women of childbearing age in order to secure optimal fetal growth and development, are only found in few food items. Milk and dairy products are the main iodine source in countries without mandatory salt iodization. In Norway, approximately two thirds of the dietary iodine intake comes from cow's milk and dairy products (due to iodine fortification of the cow fodder), while the consumption of white fish with a high concentration of iodine, has decreased. Thus, individuals who exclude milk and dairy products will be at high risk of insufficient iodine intake [1]. Following a tendency observed in other industrialized countries the substitution of cow milk with plant-based milk alternatives, is increasing, especially among young adults. The plant-based milk alternatives that are on the rise in the Norwegian market mostly contain insignificant amounts of iodine. Recent studies have indicated that there is limited awareness and knowledge of the importance of iodine for health. The life-course perspective is a framework that provides an understanding on how food and drinking practices change across life-span. "Trajectories" are a central concept in the life-course model. People develop food choice trajectories within specific situational and historical context. These food practices trajectories are dynamic. Changes in practices occur through transitions or "turning points", like starting school, getting married, moving to a new town. The life-course perspective has been adopted by a number of studies investigating food consumption and has provided insights in understanding how current food or eating practices involve past experiences as well as expectations about future outcomes and possibilities. Knowledge about milk consumption trajectories among young women, can contribute to develop nutrition communication initiatives to increase awareness about the consequences of omitting milk from the diet and suggest interventions to ensure an adequate iodine intake in this vulnerable group.

## **MATERIALS AND METHODS**

### **Study design**

The study had a qualitative interpretative research design (IPA), which aims to give insights into how a person, in a given context, makes sense of a given phenomenon. This approach appears to be particularly suitable when informants are asked to reflect upon their personal experiences, such as food practices, like in this study. The memories of milk drinking, as well as the present milk consumption practices, become parts of a narrative that "interpret" transition from childhood towards young adulthood. Researchers as well, tend to interpret these narratives both in relation to the theoretical framework of food practices in the life-course, but also according to their own ideas practices related to milk consumption. Although IPA are mostly employed in interviews, the use of IPA in focus groups interviews are increasing as a group discussion may in some situation elicit more experiential reflection than a one-to-one interview. As the experiences of practice of drinking milk though the life-course may be a topic not many have actually reflected much upon, bringing it up in focus groups may facilitate the recollection of memories and the process of "making sense" of milk consumption practices during life.

## Recruitment

By convenience sampling, participants were recruited from two universities located in Oslo, during August and September 2018. Female students from five different study programs were contacted at study site and invited to participate in focus group interviews. Eligibility criteria included female students aged between 18 and 25 years old. Five focus group interviews with young female students were performed. Each focus group consisted of 5-7 participants to yield diversity in participant responses, while keeping the groups small enough to create a comfortable environment. The focus group interviews were moderated by a trained researcher and lasted from 60 to 90 minutes [2]. A semi-structured interview guide based on the life-course perspective of food practices was developed.

## Ethics

The young women were informed about the study purpose, and those willing to participate gave informed written consent before the start of the study. The study was conducted according to the guidelines in the declaration of helsinki and was approved by the regional committee for medical and health research ethics in Norway.

## Thematic analysis

Each focus group interview was digitally recorded and transcribed by a researcher. Another researcher compared the transcripts with the audiotapes for quality control and then imported them *into NVivo* (software version 10; QSR International, Burlington, MA). Using an inductive approach, two investigators independently analyzed the transcripts to identify emerging themes relating to the concepts of interest in this study. The analysis indicated that women experienced transitional phases in their milk consumption, related both to changes in attitudes towards milk and in their milk consumption. Sub-themes related to milk consumption in the different phases were also identified. For each focus group, we created a “milk consumption trajectory” and compared it with the findings of other focus groups to identify similar patterns and differences. Themes and sub-themes emerging from the interviews are showed in (Table 1).

**Table 1:** Milk consumption trajectories: Themes and sub-themes emerging from the focus group-interviews.

	Milk as tradition and health
	Milk as “family”
	Milk as “must”
a) Milk practices during childhood	Milk as something everyone drinks
	Milk as childish
b) Milk practices during adolescence	Milk as not healthy

	Milk and skin health
	Milk and influence by friends and classmates
c) Milk practices during young adulthood	Milk in new life stages like moving away from home
	Milk as expensive and inconvenient to use
	Milk practices influenced by media
	Milk and lack of awareness of iodine sources
d) Milk practices in the future	Milk important for future children
	Milk and role models for own children

## RESULTS

### Milk practices during childhood

Milk was an important part of the diet during childhood, it was an everyday drink, and both the children and the parents drank it at breakfast, lunch, dinner and when thirsty. During their childhood, with parents as role models, and the strong position milk had in the Norwegian diet, together with high availability of milk, this became the major determinants for the milk consumption pattern in childhood.

For many young women, milk had some unique emotional connections to childhood, and they referred to milk as good and healthy, bringing back good childhood memories of safety, caring and indirectly, bonding to the mother. "Milk reminds me of my childhood and family". Milk was also available through a school milk subscription in Norwegian schools [3]. Most participants drank milk at school every day and it perceived as natural, since everybody did that. "It became a kind of ritual, so you had to have milk for every lunch at elementary school." The young women told that they had memories of picking up the milk during lunch times, and that everyone wanted to pick up the milk, to get a break from class. They also felt obligated to drink the milk since the parent had paid for it.

However, not all young women experienced milk in childhood as caring and family bonding. For some, milk brought back negative childhood memories of lukewarm milk with lumps and bad smell and memories of being forced to drink up the glass of milk served at meals.

### Milk practices during adolescence

A first shift in milk consumption practices seemed to occur during adolescence, when attendance to junior high began (14 years). Some stopped drinking milk because they felt that it was associated with being childish. From the beginning of junior high, many young women reported that they no longer had a school milk subscription, either because some junior high schools did not offer it, or their parents gave them the opportunity to decide whenever they wanted to subscribe to school milk or not. Many women said that they were tired of drinking milk and dropped the subscription, choosing to buy other drinks in the school canteen instead, like juice or soda. "I think maybe one can get a little tired (of drinking milk) too. Because I think when you drink some milk every day for ten years, and it wasn't just in school." During the focus groups, participants reflected upon the fact that adolescents are also

easily influenced by friends and classmates as they are striving to be accepted and to fit in. Participants explained how it was important to do the same as their friends and that their friends had stopped drinking milk. "Before, everyone drank milk, but now there is very little of it in general. All my friends have also stopped drinking milk. "The adolescence experienced that their milk consumption was affected by the information they got from media, which questioned the idea of milk as healthy and good for their body. "There has been a lot of media attention claiming that milk is not healthy."

Concerns about animal welfare also emerged. Some had seen documentaries like "What the health," "Cowspiracy," and "Forks over knives," and had concluded that drinking milk was not ethical both because of the living conditions of the animals and because of environmental reasons. "I don't think milk is necessary, I have heard that there are hormones in the milk that make you addicted." Some women had seen documentaries claiming that milk contained hormones and antibiotics. "I have seen documentaries. People say that it is not good for you to drink milk for some reason. Milk belongs to the calf." Skin health was a concern for much adolescence, and they had heard that they could get pimples from milk intake. Others said that they felt bloated and got stomachache from drinking milk. They felt better when they reduced or stopped drinking milk, they felt more energetic and had less pain. "I drank milk during childhood. I stopped in secondary school because of acne; I feel I am affected when I eat many milk products. That I get dirty skin from it."

### **Milk practices during young adulthood**

A significant "turning point" in milk consumption came when the young women moved away from home. Milk was no longer available all the time as in their childhood homes. They had to buy the milk themselves. Some women explained that they did not want to spend their money on milk because it was more expensive than soda and juice, and they were not able to use the milk before it expired, and, therefore, they avoided buying it. "I started to drink less milk when I moved away from home, because then I had to buy the milk myself. Milk was not available anymore. Therefore, I didn't bother spending money on it. It's cheaper with juice and stuff like that. "During the focus groups interviews the young women mentioned many plant-based milks alternatives have emerged in the last few years, like oat, soya, and rice milk, with information that they are healthier than cow's milk. They reported that these products are often considered more "trendy" or a better alternative to milk. These products were experienced as less fat / high in calories than more environmentally friendly than cow's milk.

### **Milk practices in the future**

When the young women were asked if they would give cow's milk to their own children, the responses went in both directions. Some mentioned that it is important to consume milk during pregnancy, that it is important for children during their first years of life, and that they would start to drink milk again if they had children of their own, in order to be a good role model.

### **Knowledge of iodine and milk**

During the focus groups emerged that most of the young women had not thought much about the health consequences of omitting milk from their diet. Many knew that milk is an important source of calcium, and some mentioned bone fracture and osteoporosis as consequences of excluding milk from the diet [4]. Some women said that there are no consequences of omitting milk from the diet. During the focus groups the women were also asked about iodine's functions in the body. Some women said that they had heard about iodine, hormones, and fertility, but they could not recall what kind of hormones. Most of the women admitted that their knowledge about iodine was very limited and that they had not thought about the possible consequences of omitting iodine from their diet.

## **DISCUSSION**

A life-course model of milk consumption trajectories was developed to reflect how events and experiences shaped food practices. Our findings provide an understanding of possible reasons for reduction of milk consumption among young women. We found that that milk consumption trajectories were dynamic and changed over time, with a few major transitions. The consumption of milk during childhood was greatly influenced by family traditions and school milk subscription. During adolescence, the young girls seemed to distance themselves from milk consumption as it was associated with childish food habits, and new beverages became more popular among peers. A main turning point occurred during young adulthood, when the young women left home. In this new phase of their life, factors such as availability, price, convenience, and attitudes towards their health and the environment became increasingly important. Food choice trajectories are developed within a specific situational and historical context. Most of the young women grew up in a society where milk had a strong position both as a nutritional source and as a national symbol of health and strength. It is therefore not surprising that the young women in our study said that milk consumption at home and at school was an important part of their diet during childhood and that children were expected to consume milk. Referring to the practice-theoretical perspective milk was embedded in their daily routines and was an important component of the practice of "being a family" or "being a proper child". However, as the young women entered junior high, their consumption practices and preferences towards milk tended to change. Adolescents tend to make their own decisions, often opposite of what they have been thought by their parents and redefine what is healthy and unhealthy. During adolescence, food becomes a way to distance oneself from childhood and parents. Food and drinking practices are used to build identity and to signal conformity with acceptable friendship and peer norms. In our study, young women reported that they got tired of milk and that they were more concerned about their classmates' and friends' perceptions of milk and practices regarding milk consumption than about their family habits. The practices of being a "cool teenagers" hanging out in the school yard during breaks could not possible involve drinking from a milk carton so much associated with childhood. Similar findings have been found among adolescents in Norway, showing that milk drinking was abandoned in junior high and substituted with water. Earlier studies also found that friends have important influences on dairy product consumption. While their parents had grown up in a society with strong traditions of milk consumption, the young women were more exposed to contested ideas about milk, both in terms of health and sustainability. Young women are influenced by

different communication domains (e.g., advertisements, influencers, celebrities, TV shows) and are eager to acquire health information. The young women in our study were concerned about skin health and pimples and reported that they had heard from documentaries that milk had undesirable substances, like hormones and antibiotics that could cause unclean skin and pimples. With almost unlimited access to unregulated information sources, some people seem to feel that the verification of food sources and their quality is their own personal responsibility and turn to the media for help. Yet, the quality of health- and nutrition-related messages in the media are perceived as contradictory and confusing and often not necessarily the most credible.

In Norway, young people leave their parental household by the median age of 19 years old, compared to the overall estimated average age of young people in Europe at 26 years old. According to a smaller study, only 1 in 5 Norwegian students younger than 22 years old still live with their parents. In our study, a large part of the respondents had left home and lived either alone, in shared apartments, or with a partner. As previous studies have pointed out, this transition creates new food consumption practices. For young students, this implies that they must provide their own meals, often with a small budget, a tight time schedule, and limited cooking skills. Price and convenience were aspects that also emerged among the young women, as they were likely to skip buying milk because it was expensive to buy, and it expired before they were able to use it. Still, they could drink a glass of milk with some special dishes or at special events, like when they visited their parents or grandparents. Referring again to the food trajectories model, the young women preferences towards water or other kind of not easy to perish drinks, can be understood in light of their transition into student life characterized by high mobility (between class, gym, meeting friends) and less time at home. Conflicting and confused health beliefs regarding milk seem to co-exist. For some, milk still represents a symbol of healthy eating and something they will introduce to their children, but, for others, milk is seen as “not good” for one’s health and not necessary. This attitudes towards milk provides an interesting insight on the definition and re-definition of food during lifetime into categories of “edible” and “not edible food”, or “pure” and “polluted”, milk, from being a fundamental part of diet and a symbol of “closeness to nature” during childhood, becomes a more contested food for health and ethical reasons.

The decrease in milk consumption in Norway could be explained by several factors. First, the availability of plant-based milk alternatives is increasing. Lactose intolerance, milk protein allergy, cholesterol worries, and lifestyle choices have been suggested as explanatory factors in the UK. In a study from Northern Norway, the prevalence of self-reported stomach symptoms after milk consumption was 34%. However, only 1-3% of the ethnic Norwegian population is diagnosed with lactose intolerance today. Second, the number of individuals choosing vegetarian or vegan diets is increasing, which may also contribute to the decreasing milk intake. Third, trends in Norwegian consumers’ choice have also shifted from being most affected by low prices towards what the individual consumer considers as healthy food. Milk producers have also reported rising competition from water, a preference for other dairy products, and “scare propaganda” by influencers.

Concerning young women's reflections upon milk consumption in the future, most of them regarded milk as an important part of their future children's diet, and they plan to reintroduce it as daily part of their family diet. This indicates again that food habits have to be understood as dynamic and related to negotiations among different values, opportunities, and roles. As milk represented, during their childhood, the positive emotions of care, comfort, and healthiness, some women, imagining themselves in their role as a mother and as responsible for providing their children and their family with a healthy diet, stated that they would reintroduce milk, as they tended to draw upon the repertoire of their childhood [5]. Our study reveals then a kind of paradox that young women, grown up with milk and planning to provide milk to their children, reduce their milk consumption in the very phase of life where the intake of nutrients assuring adequate iodine intake is of utmost importance.

Milk and dairy products are in fact important for human nutrition as they contain several essential nutrients, including iodine. Young women's low iodine intake can have consequences for their future children, who can be susceptible to the adverse effects of iodine deficiency. According to a recent study on iodine knowledge, approximately 40% of young Norwegian women had little knowledge of dietary sources of iodine and about the health implications of omitting iodine-rich sources from their diets. The findings of our study raise concerns as the young women also had very limited knowledge about iodine and the consequences of omitting milk from their diet.

This study has some strength and limitations. The use of the food trajectories model to explore milk consumption strengthens our capability of interpreting our data as it allowed us to consider the intersection between personal and societal events, such as the role of milk in Norwegian society and in the childhoods of the young women, or the increasing focus on sustainability and the consumption of alternative milk. A possible limitation of the study is the fact that all the young women were university students and that the study was conducted in an urban context, in Oslo. One may expect that in rural areas traditional values related to milk consumption may prevail. However, Oslo tends to attract students from all over the country, including students from rural areas. Moreover, the variation of the study programs from which the students were selected may have contributed to the recruitment of young women from different social backgrounds.

## **CONCLUSION**

We found that milk consumption trajectories were dynamic and changed over time, influenced by several factors such as family traditions, school milk subscription, friends and social media, availability, price, and attitudes towards health and environment. Most of the young women were in a phase of their life when attitudes towards milk were negative or ambivalent and milk consumption not part of daily routines. Our study emphasizes the need of promoting awareness of the consequences of omitting milk from young women's diet, in a phase of their lives when assuring an adequate intake of iodine is of utmost importance and develop strategies for assuring adequate iodine intake from other sources.



## **AUTHOR CONTRIBUTIONS**

Conceptualization, S.H. and L.T.; methodology, S.H and L.T.; software, S.H.; formal analysis, S.H.; investigation, S.G.J.; writing—original draft preparation, S.H; writing—review and editing, S.H.; I.A.; and L.T. All authors have read and agreed to the published version of the manuscript.

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## **CONFLICTS OF INTEREST**

The authors declare no conflict of interest.

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