General acceptance of goat milk infant formula

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Title:

General acceptance of goat milk infant formula.

A Research on the acceptance of goat milk infant formula among mothers in the Netherlands.

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Preface

This graduation report is written as part of the graduation phase of the study International Food & Agribusiness at Aeres University of Applied Sciences in Dronten. The graduation report is written during the period of March till August 2023.

During the course of the study I have developed an interest in infant formula. Specifically infant formula based on goat milk. Therefore I chose to use my interest in goat milk infant formula as the main topic during my graduation research and find an answer to the question ‘What is the general acceptance of goat milk infant formula among mothers living in the Netherlands?’.

On this occasion, I would like to give a special thanks to my thesis mentor Mr. E.C. Schipper for the invaluable support and guidance during the process of writing the report. In addition, I would like all individuals who participated in the interviews. Due to privacy reasons of the participants, transcripts from the interviews are available upon request.

Tim Raamsteeboers

Hellendoorn, the Netherlands, August 13

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Summary

Over the years, infant formula has become an important source of nutrition for infants, the demand for infant formula is constantly growing (Scotti, 2023). Over the last couple of decades, breastfeeding rates among mothers in the Netherlands have decreased from 74-81% to 69% (Engelse & Van Dummelen, 2020). A recent development in the industry is infant formula based on goat milk, which has become available on the European market since 2012 (Prosser, 2021).

This study aims to find an answer to the question 'What is the general acceptance of goat milk infant formula among mothers in the Netherlands?'. This can potentially help producers and sellers involved in the goat milk infant nutrition industry to get a better understanding of consumer demographics, perception, preferences & willingness to purchase goat milk formula.

Key findings of the study suggest that mothers with a higher education level are more likely to buy goat milk formula, and ones with a lower education level are more likely to buy cow milk formula. Mothers living in urban areas are more likely to use goat milk infant formula compared to ones living in less populated areas. Despite the limited awareness of goat milk formula among mothers living in the Netherlands. The mothers have a positive perception of the product. Goat milk formula is seen as a healthy alternative for different types of formula. However, negative perceptions are related to the high prices of goat milk formula. The mothers showed a preference for a hybrid approach including both online and in-store purchasing options. Overall, the mothers are open to purchase goat milk formula. Factors mainly influencing the willingness to purchase can be related to competitive pricing, and accessibility of the product. With this in mind, it can be concluded, goat milk infant formula is moderately accepted among mothers living in the Netherlands.

Based on the study, recommendations for companies involved in the and sale of goat milk formula were formulated. Companies should initiate marketing campaigns to create awareness. In addition, it is recommended marketing campaigns should target key customers, which are Dutch mothers of all ages with a high level of education, living in a urbanized area. To meet preferences for sales channel, it is recommended to make the products available both in-store and online.

1. Introduction.

Infant formula has become increasingly important as a source of nutrition for infants, the infant formula market is constantly developing, with demand for formula growing over the years (Scotti, 2023). According to recent market research conducted by Presedence Research (2022), the global infant formula market size was $58.84 billion USD in 2021. Whereafter, the infant formula market is expected to grow to $125 billion USD by 2030, the forecasted growth has an annual growth rate of 8.75% (Presedence Research, 2022). Key players such as Abbott, Nestlé, Danone, and Ausnutria, but also smaller players like Unica Global and Pure Goat Company are developing and selling infant and specialty infant formulas of all kinds.

As the demand for infant formula continues to grow, it is essential to understand the market and its underlying dynamics. Following research conducted by Martin et al. (2016), 'mothers own milk is considered to be the best source of infant nutrition' and therefore always recommended to nourish infants, evidence shows that a mothers breast milk contains essential nutrients for the infants. However due to various reasons such as difficulties with lactation, medical underlying factors such as medicine usage or illness, a child's growth, and milk pumping efforts sometimes the decision is made to discontinue with breastfeeding (Odom et al., 2013). According to a study by Theurich et al. (2019) worldwide breastfeeding rates are the lowest within the European continent, the study identified that 60% of the mothers discontinue breastfeeding before the intended time to stop. By the time infants reach the age of 6 months, only 25% of the infants in Europe remain exclusively breastfed (Theurich et al., 2019). Parents who discontinue breastfeeding introduce infant formula as a replacement for breastfeeding into the diets of infants (Theurich et al., 2019).

Infant formula is formulated to nourish infants up to twelve months of age and is used as a substitute for human breast milk (Happe & Gambelli, 2015). According to Happe & Gambelli (2015), the formula aims to mimic the composition of human breast milk, with as purpose to serve as a full or partial alternative to breastfeeding. The nutritional values of human breast milk change during lactation and is different among individuals (Lönnerdal & Hernell, 2016). Following research conducted by Lönnerdal & Hernell (2016) protein levels in human breast milk are significantly higher during early stages of lactation, compared to stages further on during lactation. According to Lönnerdal & Hernell (2016), hypothetically seen it is the best to have different compositional stages of infant formula focusing on 0-3, 3-6, and 6-12 months. The approach enables to mimic the nutritional values of human breastmilk more precisely compared to current practical application (Lönnerdal & Hernell, 2016). However, current

practical application shows there are different rules for infant formula stages among continents (Lönnerdal & Hernell, 2016). Following Lonnerdal & Hernell (2016), infant formula sold in the US has to comply to one set of nutritional standards, and is used to nourish infants up to twelve months.. Within the Europe Union, the rules states, infant formula has to comply to two different nutritional standards: stage one formula is intended to nourish infants up to six months, while stage two formula is intended to nourish infants from six up to twelve months (Lonnerdal & hernell, 2016).

Infant formula is available on the market in three primary forms, powdered, concentrated liquid, and ready-to-feed (Martin et al., 2016). Following Martin et al., (2016) powdered infant formula is the least expensive form of the three, the powder must be mixed with a specific amount of water before feeding. Concentrated liquid formula is more expensive, and also requires mixing with a specific amount of water (Martin et al., 2016). While Ready-to-feed formula is generally seen as the most expensive form of infant formula on the market, the formula is portioned in a ready to feed bottle (Martin et al., 2016).

According to Rossen et al., (2016), infant formula can be based on several different types of bases, cow-milk based formula is the most popular standardized type of infant formula. Within the United States, 69% of consumed infant formula is cow-milk based (Rossen et al, 2016). Whereas, 12% of the infant formula used is soy-protein based (Rossen et al, 2016). Research shows that soy based formula is more popular within higher-salaried communities (Rossen et al, 2016). In order to use cow-milk as infant formula, the milk is skimmed and diluted (Dipasquale et al., 2019). According to Dipasquale et al. (2019), the characteristics of unmodified cow milk differ from human breast milk, cow milk contains protein which levels are 55% to 80% higher compared to human breast milk. Necessary antibodies, polyunsaturated fatty acids, bacteria, vitamins, minerals, and bioactive peptides are added to the formula after the process of skimming and diluting the cow milk, the steps are necessary in order to mimic human breast milk (Dipasquale et al., 2019). According to Dipasquale et al. (2019) Infant formula made with soybean protein is considered as plant based, in order to mimic human breast milk, vegetable oils, glucose syrup, amino acids, vitamins, and minerals are added. Soy-protein based infant formula can be seen as lactose-free, and therefore can be used to nourish infants who are lactose intolerant (Dipasquale et al., 2019). Following, Dipasquale et al. (2019), parents opting to nourish their babies with a vegetarian diet by choosing soy-protein based infant formula as an alternative to cow-milk based formula. Currently, Soy based infant formula is not easily found on the European markets, however the product continuous to have a significant

presence on US markets (Vandenplas & Nutten, 2018). Following Ronis et al. (2022) the limited availability soy based infant formula within Europe is possibly caused due to the high isoflavone content of the product. Isoflavones possibly increase estradiol level of an infant, which can result in limited male reproductivity (Ronis et al. 2022). However, results from an animal feeding study did not indicate a limited reproductivity, therefore the product is currently safe enough to remain on the US market (Ronis et al. 2022).

In addition to standardized cow-milk and soy-protein based infant formulas, there are specialized infant formulas on the market (Dipasquale et al., 2019). Specialized formulas are designed to meet the nutritional needs of infants who have specific health conditions or dietary needs that are not met with the use of standardized infant formula's (Dipasquale et al, 2019). Complications such as a lactose intolerance or a specific clinical condition such as allergy, prematurity, or gastrointestinal diseases, require different nutritional intakes for the infant (Dipasquale et al., 2019). A study by Schichter-Konfino et al. (2015) identified that cow milk allergy is the most common type of allergy under infants. Between 1.9% to 4.9 % of the infants suffer from cow milk allergy (Vandenplas & Nutten, 2018). Specialized formula's such as extensively hydrolyzed formula (eHF), and amino acid formula (AAF) are designed to nourish infants suffering from cow milk allergy (Vandenplas & Nutten, 2018). eHF is a hydrolyzed form of cow-milk formula, where the peptide bonds of amino-acids are broken down, in order to, reduce the allergic reaction of infants (Nowak-Wegrzyn et al., 2015). According to Vandenplas and Nutten (2018) research identified there is a possibility for up to 5-10% of infants with cow milk allergy to still have an cow milk allergy related reaction after consuming eHF. The reaction is caused due to the fact eHF is cow-milk based, and the infants are reacting on the residual cow milk protein in the formula (Vandenplas & Nutten, 2018). Following Dipasquele et al. (2019), AAF is recommended for infants still having a form of a allergic reaction on eHF. The composition of AAF is cow milk protein free, it is solely made from amino acids, without any involvement of cow milk protein in its production process (Vandenplas & Nutten, 2018). A study by Vandenplas & Nutten (2018) showed AAF is significantly more expensive compared to other types of infant formula. Despite the high cost of the formula, it is considered as appropriate for nourishing infants allergic to cow milk and intolerant to lactose (Vandenplas & Nutten, 2018).

During recent decades, there have been several disruptions within in the infant formula industry. Typically seen as one of the largest incidents within the whole food supply chain is the melamine crisis which occurred in 2008 in China (Gossner et al., 2009). Following Gossner et

al., 2009, melamine, a chemical what is usually used to make plastic and fertilizer was added to milk at milk collecting stations. As a result, milk related products including powdered infant formula contained highly added amounts of melamine (Gossner et al., 2009). The intentional addition of the chemical caused health symptoms under 300000 chinese infants, and killed 6 babies (Gossner et al., 2009). However, the crisis not only remained in between Chinese borders, 44 countries worldwide reported cases of melamine traces in food products and ingredients imported from China (Gossner et al., 2009). Individuals intentionally added melamine to food products with a financial incentive (Gossner et al., 2009). According to Gossner et al., (2009), high melamine levels in food products cause health symptoms such as kidney stones. Following an article by NBC (2009), a Chinese court sentenced two men, held responsible for putting melamine in milk to death by execution. Worldwide effects were in place after the crisis, the melamine scandal caused a fast increasing demand for safe infant formula within China (Xiu & Klein, 2010). According to Xiu and Klein (2010), Chinese parents lost confidence in dairy products, from domestic producers. Chinese parents started to do panic buying overseas (Xiu and Klein, 2010). Following Cooper and Gordon (2021) panic buying is a behavioral phenomenon occurring when an unfortunate event, such as a crisis in a chain occurs, it can lead to discrepancy between supply and demand. The panic buying in China caused a disparity in supply and demand of infant formula resulting in a reported unavailability of infant formula on shelves within Australia, and other countries all over the world (Xiu & Klein, 2010). The disruptions in the infant formula market stimulated European multinational dairy firms to do large investments within the infant formula industry (Xiu & Klein, 2010).

A more recent market disruption within the infant formula industry dates from 2022. A sudden shortage of infant formula within the United States occurred after one of the largest US based infant nutrition producers closed a factory in Michigan (Doherty et al., 2022). Following an article by Kimball (2022), the voluntary closure of the factory was caused due to the fact the Cronobacter sakazakii bacteria was found within the facility. According to Kimball (2022), the Cronobacter bacteria is known for causing blood infections when consumed by human. Several products, including infant formula manufactured within the Michigan facility were recalled (Doherty et al., 2022). According to the US Food and Drug Administration, FDA (2022), the recalled formula was distributed to 36 countries outside the US. According to Doherty et al. (2022), The impact of the recall was the most significant withing the US, the Cronobacter bacteria caused almost 45% of infant formula shelves within the US were out of stock. Causing uncertainty under parents, the unavailability of the infant formula resulted in panic buying

behavior across the country (Doherty et al., 2022). According to Goodman and McPhillips (2004), in order to tackle the shortage of infant formula within the US president Joe Biden announced Operation Fly Formula. The operation, involved the air shipment of more than tens of million infant formula cans from all over the world (Goodman and McPhillips, 2004). The operation ensured that parents urgently relying on formula to nourish infants had access to it (Goodman and McPhillips, 2004).

A relatively new concept on the infant formula market is infant formula based on goat milk (Prosser, 2021). Goat milk products have been on the market for thousands of years, however, goat milk formula has not been commercially available since not so long ago (Prosser, 2021). According to Prosser, (2021) In order to commercially become available on the market, an infant formula has to be appropriately manufactured, tested and eventually assessed during a clinical evaluation. Following Zhou et al., (2014), the aim of a clinical assessment of infant formula is to test 'the safety and nutritional adequacy' of a product compared to a product which is already market fit. For infant formula, the aim of such study is to see if infants fed with a new type formula have the same 'growth, nutritional status, and allergy related outcomes', compared to product which is already on the market (Zhou et al., 2014).

In 2004, a clinical study to test the safety and nutritional adequacy of goat milk formula was performed (EFSA Panel on Dietetic Products, Nutrition and Allergies (EFSA NDA), 2004). Whereafter the European Food Safety Authority EFSA released a statement that goat milk proteins were found inadequate to be suitable for infant formula (EFSA NDA, 2004). Following a statement from EFSA NDA, (2004), inadequacy of goat milk formula was observed due to insufficient evidence to proof the nutritional adequacy of goat milk formula. Another clinical study to proof the nutritional adequacy was performed around 2012 (EFSA NDA, 2012). However, the results of the clinical study gathered enough proof to comply with European food safety rules (EFSA NDA, 2012). The EFSA Panel on Dietetic Products, Nutrition and Allergies, (2012), released a statement goat milk was suitable as protein for infant formula. With as result, goat milk infant formula was ready to be used for commercial purposes on the European market (EFSA NDA, 2012). The EFSA was established in 2002, with as aim to provide scientific information and to serve as a foundation for laws protecting European consumers from food-related concerns (EFSA, n.d.).

According to Prosser (2021) there is evidence stating goat milk formula possibly has a positive impact on gastrointestinal and eczema related outcomes when consumed by infants. The positive impact can be caused by the difference of nutritional composition in comparison with

standardized cow milk formula (Prosser, 2021). Prosser (2021), specifically stated “there is a need for more translational research and clinical trials to confirm the positive differences”. There reasoning no specific evidence for the positive impact is due to the fact current evidence is gathered from laboratorial experiments and animal studies (Prosser, 2021). Currently, there is no goat milk formula available for commercial use on the US market (ObvioHealth, 2023). The Food and Drug Administration has not approved a goat milk based infant formula (ObvioHealth, 2023). According to ObvioHealth (2023), currently there is a clinical trial in place for a goat milk infant formula, the company performing the trail aims to get approval by the FDA to be the first commercially available goat milk formula on the US market.

According to Engelse and Van Dommelen (2020), in the Netherlands, breastfeeding rates are decreasing. Over the period from 2001 till 2015, approximately 74-81% of the mothers started with breastfeeding directly after birth (Engelse and Van Dommelen, 2020). However, according to a research conducted in 2018 indicated that the rates have soared to 69% directly after birth (Engelse and Van Dommelen, 2020). After six months of birth, only nineteen percent is breastfed (Engelse and Van Dommelen, 2020). In contrast, the infant formula feeding rates in the Netherlands have shown an increase, suggesting a rise in the acceptance of infant formula among mothers in the country (Engelse and Van Dommelen, 2020).

The consumer prices of infant formula on the Dutch market are diverse. When looking at prices from cow milk formula house-brands such as Albert Heijn, Etos, and Kruidvat, the price range for infant formula extends from around €9 to €13 a kilo (Babyvoedingchecker, 2023). Established brands such as Nutrilon and Hipp have slightly higher prices, ranging from €21 to €22 a kilo (Babyvoedingchecker, 2023).

In contrast, the prices of goat milk infant formula higher. According to babyvoedingchecker (2023), goat milk infant formula brands such as Jovie, Kabrita, and NannyCare offer one kilogram of infant formula for prices ranging from €37 to €44.

As mentioned by Martin et al, (2016) there are lots of different types of infant formula on the market, from cow milk formula to specialized formula and goat milk formula. Goat milk formula is recently available on the European market, and therefore relatively unknown (He et al., 2022) This study is designed to find an answer to the following main research question. What is the general acceptance of goat milk infant formula among mothers in the Netherlands? In order to answer the main question, three sub questions are formulated;

- Does the usage of goat milk infant formula vary among mothers within different sociodemographic groups?
- What is the perception on goat milk infant formula among mothers in the Netherlands?
- What are the preferences for sales channel and willingness to purchase goat milk infant formula among mothers in the Netherlands?

The aim of the research is to help producers and sellers within the infant nutrition industry to get a better understanding on consumer behavior in the infant formula market. This research specifically focuses on the relatively unknown goat milk infant formula market in the Netherlands.

2. Materials and Methods.

The objective of the study was to find an answer to the proposed main question ‘What is the general consumer acceptance of goat milk used infant formula among mothers in the Netherlands?’. The study targeted mothers living in Netherlands within different age groups. The Netherlands as geographical location for the research was chosen due to the high accessibility of the participants for the author. Due to the fact, the research aimed at mothers living within the Netherlands, the criteria for participants was not limited towards mothers with the Dutch nationality only.

The study had a criteria, mothers who participate in the interviews should have given birth at least once in or after 2002. The decision for the limitation has been made due to the establishment of the European Food Safety Authority in 2002. As explained in the introduction, The EFSA was established in 2002, with as aim to provide scientific information about food-related products, which serves as a foundation for laws in the European Union protecting European consumers from food-related concerns (EFSA, n.d.).

2.1 Research approach

The main research is based on a qualitative approach, the approach is utilized to gain a deeper understanding of reasoning behind consumer perceptions, and behavior regarding goat milk infant formula (Goetzen, 2023). With as aim to define motivations behind decision making for, and acceptance of different types of infant formula (Goetzen, 2023). According to Jamshed (2014), the most common type of qualitative research methods are interviews and focus groups. In order to find motivations behind decision making, an inductive reasoning approach will is used (Dodovskiy, n.d.). With the use of data gathered from interviews, and an inductive reasoning approach a grounded theory was developed (Dodovsiy, n.d.).

First, a recruitment survey displayed in appendix I was distributed through Linkedin, and WhatsApp. With as aim to recruit mothers from different sociodemographic groups. The demographic aspects consist of, age, highest level of education, geographical location, and nationality. According to Hayes et al (2022), demographic questions, help companies within the infant formula industry to gain a deeper understanding of customer persona demographics. The aim of the collected data is to answer sub question one; Does the usage of goat milk infant formula substitute vary among mothers within different sociodemographic groups?

After the recruitment survey was conducted, the participants received a personal invite to participate in a 10-20 minute interview. The semi-structured interview is displayed in appendix II. According to Jamshed (2014), semi-structured in depth interviews are commonly used during individual interviews. The aim of the interviews is to answer sub question two; 'What is the perception on goat milk infant formula among mothers in the Netherlands?', and sub question three; 'What are the preferences for sales channel and willingness to purchase goat milk infant formula among mothers in the Netherlands?'.

Overall, sample sizes of qualitative study's vary for each different type of study (Hennink & Kaiser, 2021). For a qualitative research, with interviews the sample size is considered large enough when data saturation is reached (Hennink & Kaiser, 2021). Data saturation is reached when no new information is obtained from interviews (Hennink & Kaiser, 2021). According to research from Hennink and Kaiser (2021) the average amount of interviews needed in order to reach data saturation lays between nine and seventeen. For this research a total of ten mothers were recruited and interviewed. The interviews were recorded and transcribed. All interviews were held in Dutch, and later translated into English. As mentioned in the preface, transcriptions of the interviews are available upon request.

3. Results

The following part displays the results section. The results are given according to the structure of the sub-questions. Starting with the demographical influence towards the usage of infant formula. Followed by the participants perception on goat milk formula, preference for sales channel, and the willingness to purchase goat milk formula.

3.1. Demographical influence.

This section displays the demographical results obtained from the interviews, with as aim to answer the sub-question 'Does the usage of goat milk infant formula vary among mothers within different sociodemographic groups?'. The sociodemographic aspects considered in this study include the participants age during birth, level of education, and geographical location. First, the results from sociodemographic data, are related towards the type of infant formula used to nourish the children of the participants. Whereafter different demographic factors are related to each other, in order to find a relation between level of education, geographical area, and type of infant formula used by the participants.

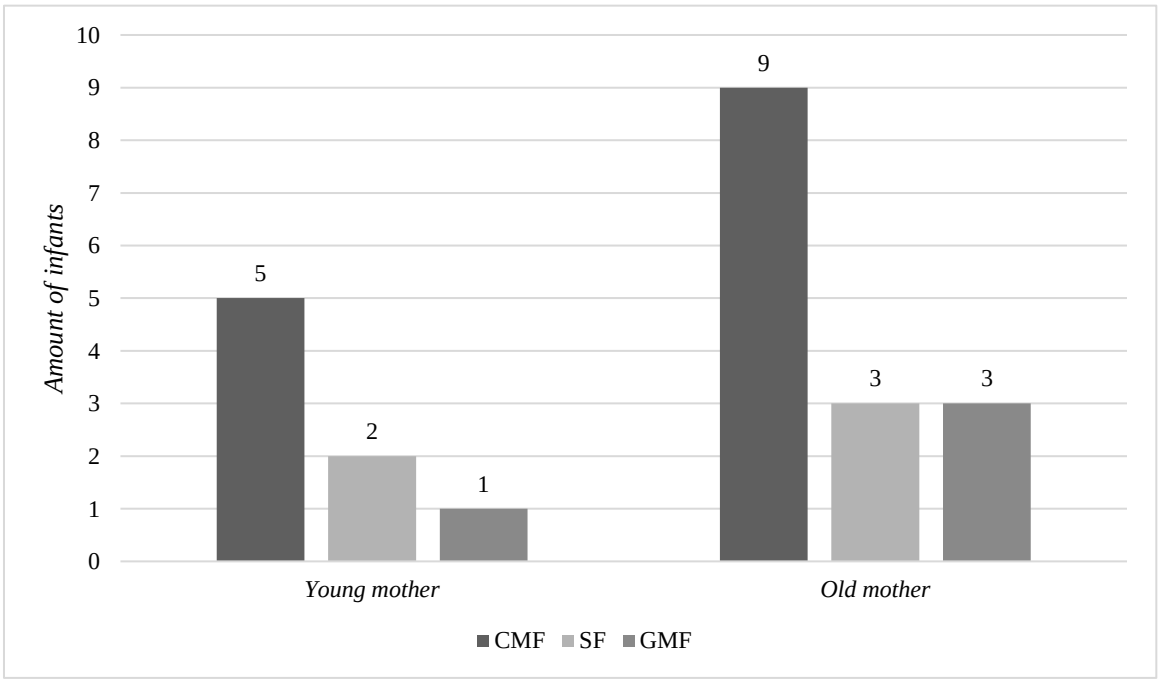
Retrieved demographic data from each participant is displayed in table 1 in Appendix III. Overall, three types of infant formula were used by the participants to nourish the children. The different types of formula include; cow milk formula, specialized formula, and goat milk formula. Participant one and two both chose to nourish their children with cow milk formula. Both participants have three children. Participant three, decided to nourish both children with specialized formula after the children did not thrive on cow milk formula. The participant explained 'The doctor prescribed different types of infant formula for a month before diagnosing my children with cow milk allergy'. Participant four used cow milk formula to nourish the child. Participant five nourished both children with goat milk formula. The participant expressed confidence in the product due to their job at a company involved in the development and sale of goat milk formula. Participant six nourished the first child with cow milk formula and the second child with goat milk formula. Participant seven initially used cow milk formula to nourish the youngest two children, However, the third child was nourished with goat milk formula. Participant seven specifically stated 'During the time my oldest two were young there was no goat milk formula on the market. when the youngest was born, I made the decision to use goat milk formula'. Participant eight nourished all three children with specialized formula, all three children got diagnosed with cow milk allergy. Both, participant nine and participant ten opted for cow milk formula to nourish the children.

Figure two displays the age of mother compared to the type of infant formula used to nourish the children. According to Central Bureau for Statistics (2022) the average age of a mother during childbirth in the Netherlands over the past decades is approximately 31. The mothers are categorized in two groups, relatively young mothers aged 31 or younger during childbirth. And relatively old mothers, aged 32 or older during childbirth.

Among the group of relatively young mothers, five children were nourished with cow milk formula, two children were nourished with specialized formula, and one got nourished with goat milk formula. In contrast, among the group of relatively old mothers during childbirth, nine were nourished with cow milk formula, three got nourished with specialized formula, and three got nourished with goat milk formula.

Figure 1

Type of Infant Formula used to nourish infants compared to the age of the mother during birth.



Note. Observations were adapted from in-person interviews, total number of children =23

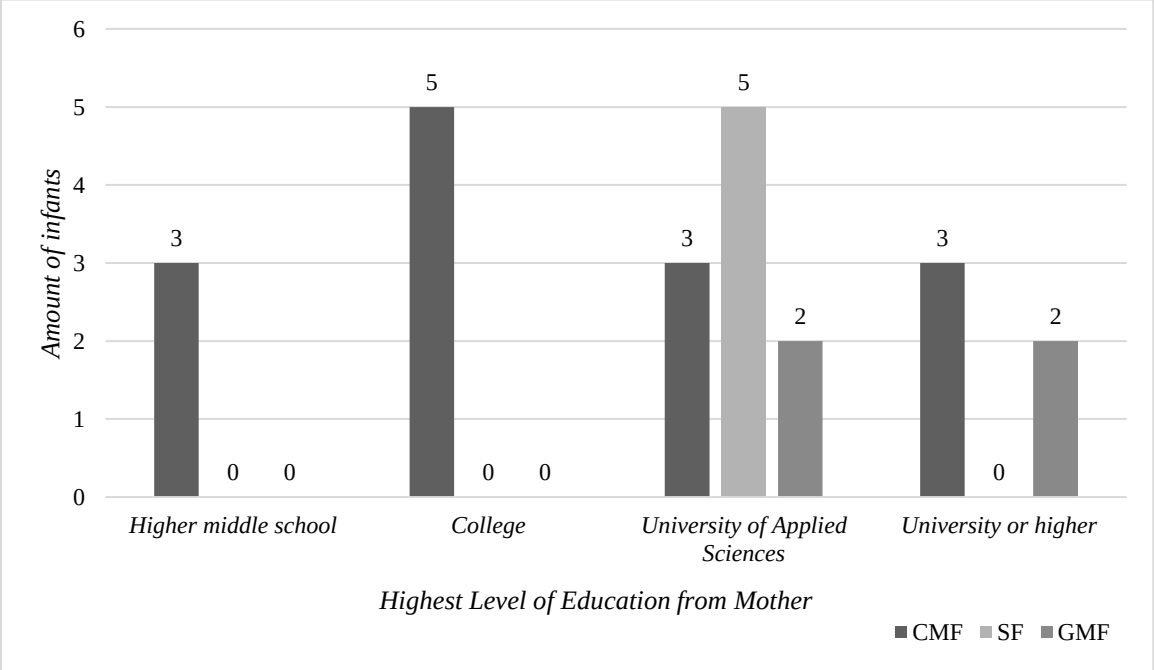
Figure two below, displays the relationship between the level of education of the participants and the type of infant formula used to nourish for each of the children. As displayed in appendix three, in total, there are four different levels of education among the ten participants. Including, higher middle school, college, university of applied sciences, and university or higher.

Participant one has three children attended, the participant attended higher middle school, and used cow milk formula to nourish the children during the first year after birth. Participant four, nine and ten attended college, the participants have a total of five children. All five children got nourished with cow milk formula.

Participants two, three, five, eight, and ten finished University of Applied Sciences. Among the children of the participants, three were nourished with cow milk formula, five with specialized formula, and two with goat milk formula during the first year after birth. Participant six and seven hold a university degree or higher and had a total of five children. Two of the five children were nourished with goat milk formula, while the other three children were nourished with cow milk formula.

Figure 2

Infant Formula Usage Based on Mother's Highest Level of Education



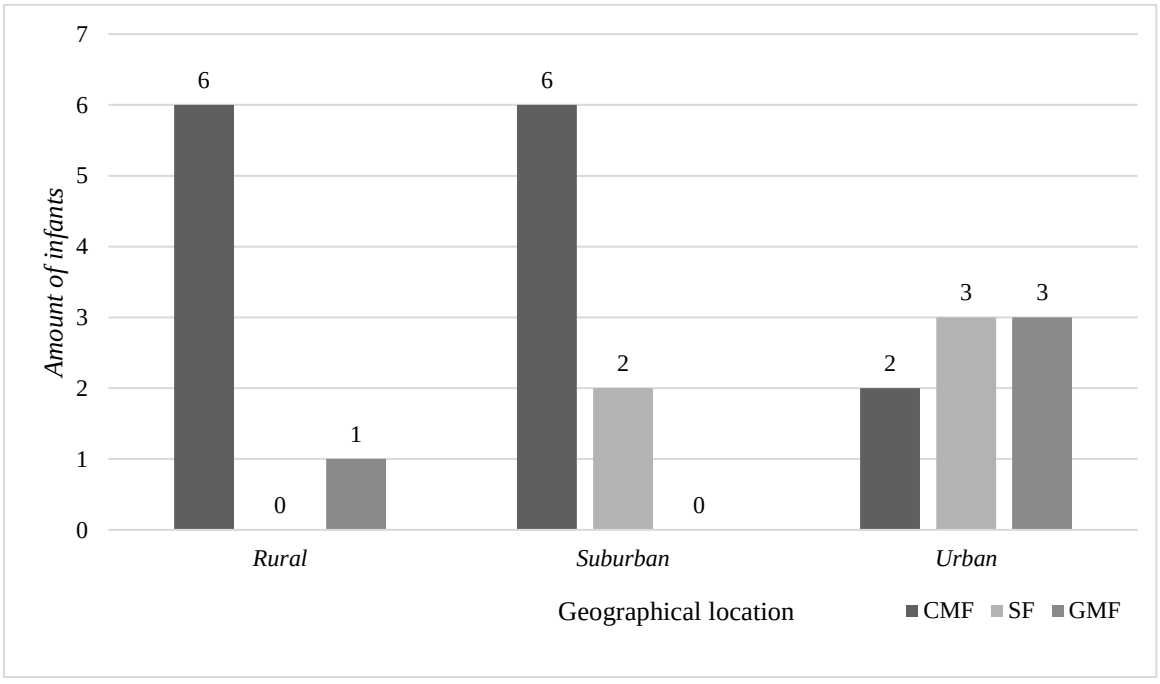
Note. Observations adapted from in-person interviews, total number of children=23

The following section, analyzes the relationship between the type of infant formula used and the geographical area of the participants. Figure three below, presents a comparison of the geographical areas with the types of infant formula used among participants to nourish the children.

The study includes three participants who live in a rural area, the three participants have a total of seven children. From which six out of seven children were nourished with cow milk formula, and one child was nourished with goat milk formula. Among the eight children from the three participants living in a suburban area. It can be observed, six children were nourished with cow milk formula, and two were given specialized formula. Additionally, four participants are living in an urban area, the four participants have a total of eight children. From which, two children were nourished with cow milk formula, three with specialized formula, and three with goat milk formula.

Figure 3

Amount of Infants and type of Infant Formula used to nourish by Geographical area.



Note. Observations adapted from in-person interviews, total number of children=23

The last part of the demographic section connects the relationship between the participants highest level of education, geographical area, and feeding choices for the children to each other. A visualization of the results obtained from the interviews, is displayed in figure four.

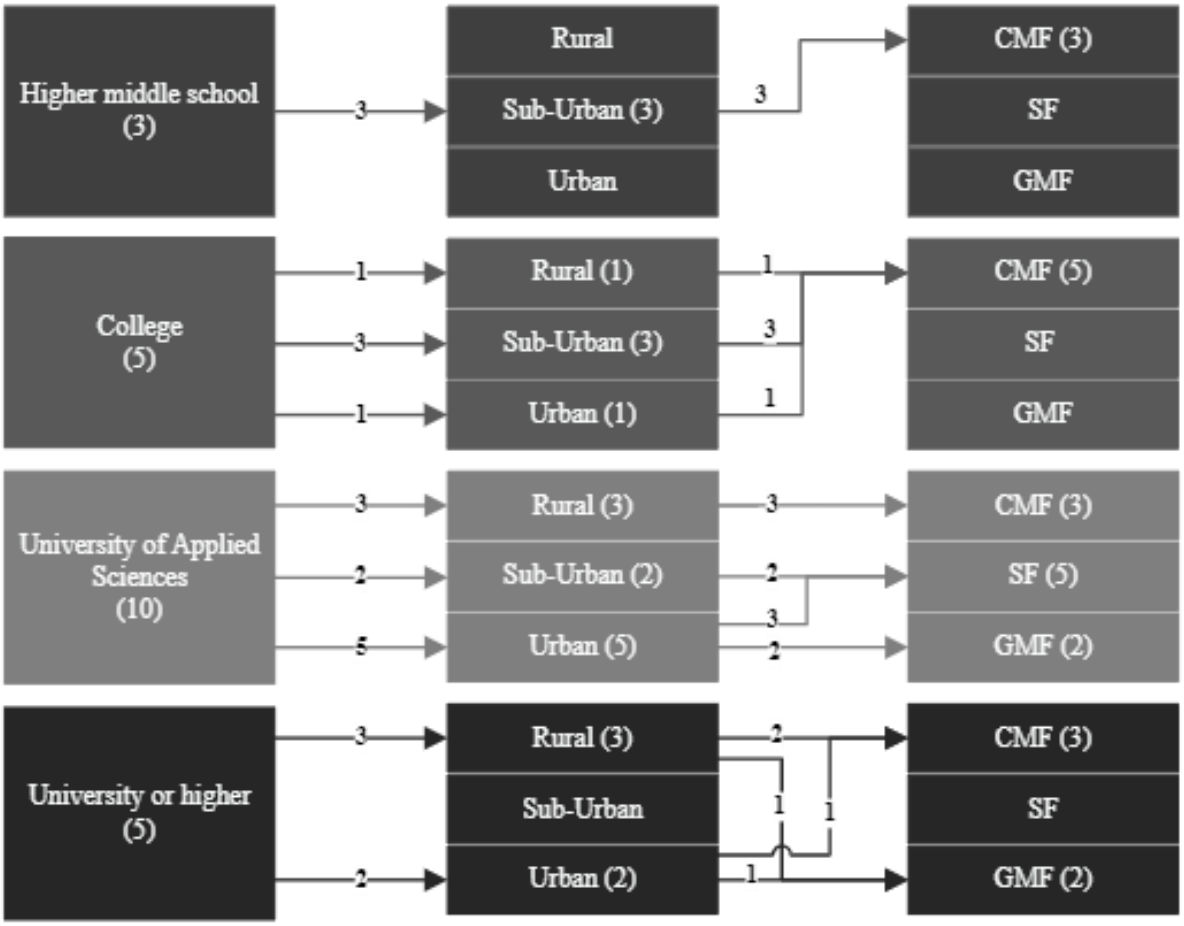
Multiple patterns are identified, participants who finished higher middle school have three children, all living in an urban area. In addition the three children are nourished using cow milk formula. The interviews revealed participants with a college degree have a total of five children. Participants lived in three different areas, from which, one child lived in a rural area, three lived in a suburban area, and one in an urban area. A remarkable pattern is, all children from participants with a college degree were nourished with cow milk formula.

Participants who finished University of Applied Sciences had a larger group of children. In total, the group consists of ten children. Amongst the children, three lived in a rural area, which were all nourished with cow milk formula. Additionally, participants living in suburban areas have two children, who were nourished using specialized formula. Furthermore, five children lived in an urban area, in total three of the children were nourished with specialized formula and two with goat milk formula.

Within the group of children from participants who have a university or higher degree, there are five children. From which three lived in rural areas, two were nourished with cow milk formula and one with goat milk formula. Additionally, two children lived in urban areas. One got nourished using cow milk formula and two with goat milk formula.

Figure 4

Relation between level of education, geographical area, and type of formula used by participant to nourish the infants.



Note; CMF = cow milk formula, SF = specialized formula, GMF = goat milk formula

3.2. Consumer perception.

This part of the study focuses on displaying the results obtained from the interviews, aiming to answer the second sub-question: 'What is the perception of goat milk infant formula among mothers in the Netherlands?'. Observations from the interviews show the different perceptions on goat milk formula among interviewed participants. Out of ten mothers, only four mothers knew of the existence of goat milk formula, the six other mothers had never heard about the product. From the four participants knowing of existence of the product, three have knowledge about goat milk formula. The participants have a different perception about goat milk formula. Figure five below displays the different perceptions of participants on goat milk formula.

Participant one, two, three, four, nine and ten do not know about the existence, and have no knowledge about goat milk formula. Participant one has a positive feeling towards goat milk formula. The participant explained 'my feeling is that the product would be more healthy compared to cow milk formula' Participant two stated 'I know some children have cow milk allergy, and I have never heard of goat milk allergy, in a way it might be a more healthy option',. Different than participant one and two, participant three has a negative association with goat milk formula, 'I associate the product goat milk formula with the dirty smell of a goat'. Participant four has the perception goat milk formula is a more healthy alternative compared with cow milk formula. In addition 'I think goat milk formula is a very natural product' was stated by participant four. Participant nine has neutral perception about the product. The participant says 'Overall I believe every product sold in a Dutch store is nutritional adequate, therefore I do not think about such products'. As last, participant ten mentioned, to have no clue how to perceive goat milk formula, and thus has a neutral perception about goat milk formula.

Participant five, six, seven and eight have do know about the existence of goat milk formula. Wherefrom participant five, six and seven have knowledge about the product due to the profession or previous job operating within a company operating in the distribution and sale of goat milk infant formula. Participant five stated 'I believe in the digestibility of the product based on experience. I know, goat milk formula is soft for the stomach. Once I had to switch to cow milk formula, due to unavailability of the product. With as result my daughter got bad stools, and became very unhappy'. Whereafter participant five added 'I see the products as a more healthy alternative compared to cow milk formula.'

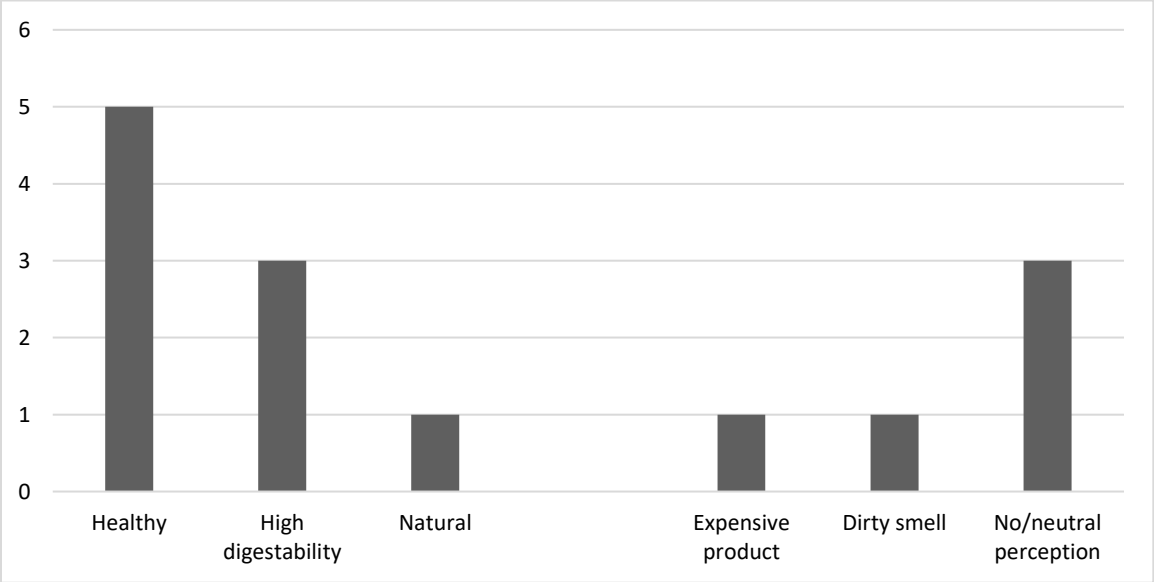
Participant six has knowledge about goat milk formula, due to being a professional working for a company involved in the development and sale of goat milk formula. The participant has a negative association as well as a positive association with the product. In a positive way, the

participant mentioned the product is highly digestible due to the compositions of protein. The negative association is price related, goat milk formula is more expensive compared to cow milk formula. After which she added ‘As a consumer you want the best for your kid, but it does not have to be the most expensive product available’

Simultaneously, participant seven mentioned goat milk formula is highly digestible. In addition, the participant stated ‘goat milk formula consists of oligosaccharides which you can also find in human breastmilk. Besides that, goat-milk has Beta palmitate in it, which is a fatty acid that can easily be absorbed by children. Beta palmitate cannot be found in cow milk’ and concluded that goat milk formula is a healthy option. As last participant eight mentioned, even though knowing of existence of goat milk formula. But to have no positive nor a negative feeling towards goat milk formula, due to the fact the participant has no knowledge about the properties of the product.

Figure 5

Consumer perception on Goat Milk Formula.



3.3. Preference for Sales Channel and Willingness to Purchase.

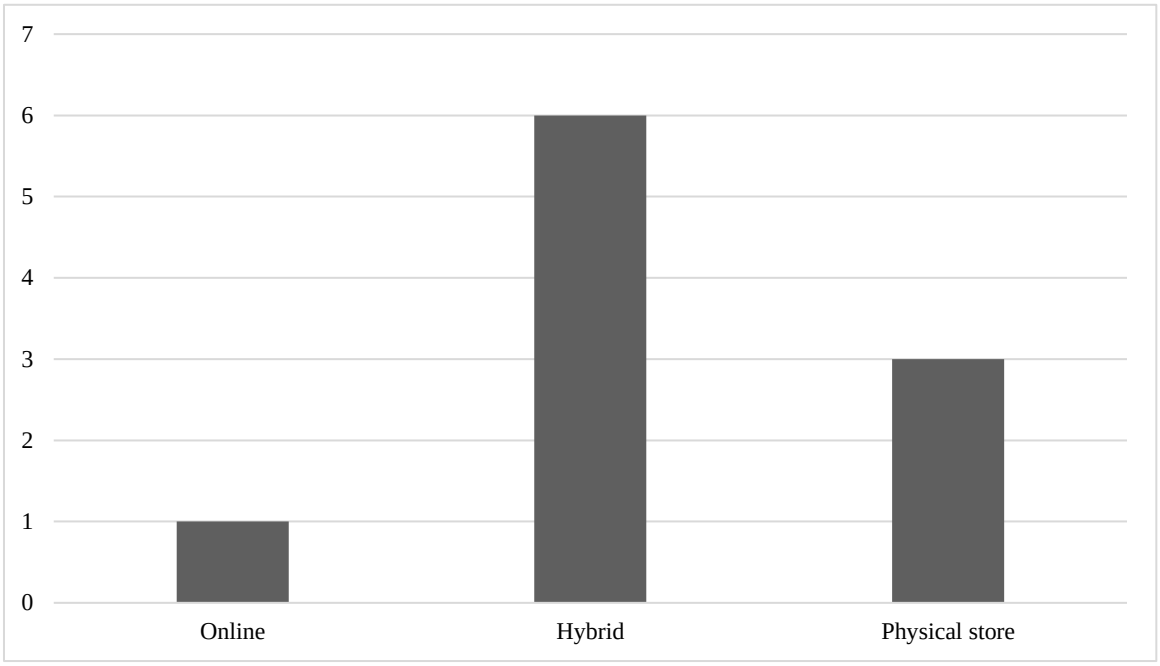
This part focuses on the preferences for sales channel, and willingness to purchase goat milk infant formula. During the interviews, participants were asked ‘What would be the preferred sales channel if you were to buy infant formula today?’. The results regarding the preferences for sales channel are displayed in Figure 6 below.

Multiple participants mentioned, to prefer to buy infant formula online, or a hybrid approach with buying the product in a physical-store. Participant one stated ‘I would prefer to put a product directly I my shopping cart’, but thereafter mentioned buying the product online would be okay as well. Followed by participant two, preferring to buy the product online. Participant four mentioned, that both online or a physical store would be preferred. However, the participant stated ‘I would prefer to physically touch a product before I buy it online’. Participant five would normally go to a supermarket for food related products, but mentioned ‘for a special product such as infant formula, a combination with online would also be fine’. In addition, participant six expressed it is important to first touch physically touch a product in store. Thereafter, the participant would buy the product online as well. Participant seven stated ‘a combination of both a physical store in the form of a supermarket or drugstore, and online’. Personally, participant nine would order the product online, but it is convenient if the product is also available in store.

Some participants expressed a preference for purchasing infant formula exclusively in physical stores. Participant three indicated to have a tendency to buy products mainly from local stores, as the participant believes in the importance to support the existence of local stores. Participant eight stated that to prefer to have a product in hand before making a purchase, hence only would buy infant formula in a physical store. Similarly, ‘I think I would go to a store, this way, I can see the product with my own eyes before I buy it’, leading to choose a physical store as the preferred sales channel.

Figure 6

Preference for sales channel of goat milk infant formula



Furthermore participants got asked the question ‘With your current knowledge, would you be willing to purchase goat milk infant formula? (imagine if you were to have a child today)’. The aim of the question was to identify the willingness to purchase goat milk formula. In addition the participants got asked; ‘Why would you (not) be willing to purchase goat milk formula?’. Aiming to identify the factors influencing the willingness to purchase of goat milk formula. A summary of the factors influencing the willingness to purchase goat milk formula is displayed in figure seven.

Participant one, would be open to buy goat milk infant formula, and stated the following, ‘factors mainly influencing my decision would be availability and price.’ Participant two is uncertain about the willingness to purchase goat milk formula, and would seek advice from a professional before considering to buy the product. In addition, price is mentioned to be highly important in the decision making process. The participant stated ‘Specifically looking at goat milk products, I would first go for cow milk products due to the fact I was born and raised on a cow-farm’, explaining that origin has an influence on the decision.

Participant three mentioned to be open to buying goat milk formula. But indicated to always go for old and reputable brand before trying a new products. In other words, the decision would be considered to choose a reputable trusted brand.

Participant four explained to be willing to use goat milk infant formula, however, price would be of influence on the final decisions. The participant added, to be open to use alternative products, instead of using a reputable brand.

Participant five is willing to purchase goat milk infant formula again, it is a decision the participant and husband made together when getting children. Without having any influence from an external factor.

Participant six, would buy goat milk formula, but would specifically look at nutritional value of the formula, due to the background as nutritionist. In addition, availability of the product is of importance, and would definitely switch to another brand if the product is unavailable.

Participant seven would buy goat milk formula since the participant already used the product for one of the children, price of a product influences the decision of the participant. As a professional in the industry, the participant would recommend, ‘parents can confidently begin with a store brand as it also complies with all regulations. In essence, those products are

perfectly fine. However, if there are any complications with an infant, I would definitely suggest switching to goat milk formula instead of any reputable brand.'

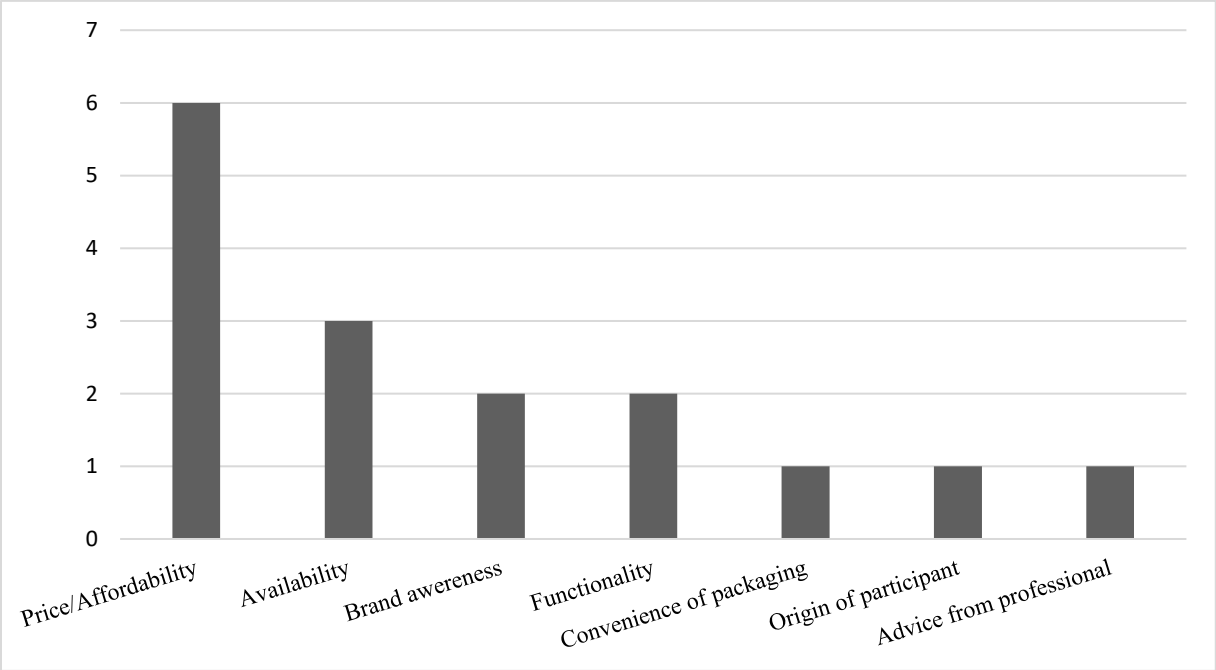
Participant eight stated 'I would buy any formula based on any type of milk, I don't mind if it is based on cow, goat, camel, horse milk. The only factor influencing my decisions is that the children have to thrive on the product. In addition, participant eight mentioned, 'Personally I think goat milk formula must be integrated more, my generation only drank cow milk when we were younger'

Participant nine would not buy the product. The participant explained 'the product should be available at every store, the packaging should be convenient, and it must be affordable. Since all three children were satisfied with cow milk formula I would stick to that.'

As last participant ten expressed a willingness to try new products but stressed that the product must be beneficial for their child, thus must thrive on the product. Brand awareness and reputation are also influential factors in their decision-making process.

Figure 7

Factors influencing willingness to purchase Goat milk Formula.



4. Discussion of Results

In this section, the discussion of results is displayed. The aim of the discussion is to interpret the results on three main topics: the demographical influence, consumer perception, and preferences for sales channels & willingness to purchase goat milk infant formula among mothers in the Netherlands. Furthermore, a critical reflection on the research method is provided to address strengths and limitations of the research.

4.1. Demographical influence

The objective of this part of the discussion of results is to discuss the sub-question 'Does the usage of goat milk infant formula vary among mothers within different sociodemographic groups?'. The sociodemographic groups considered in this analysis include the participants age during birth, level of education, and geographical location. Aiming to provide companies operating within the infant formula industry with insights in preferences and relations for the type of infant formula used by different sociodemographic groups.

The study identified the types of infant formula used among younger and older mothers based on the age during birth. Among the group of mothers who gave birth at a relatively young age, a total of eight children were born. Out of eight children, five were nourished using cow milk formula, two were nourished using specialized formula, and one was nourished using goat milk formula. In contrast, among the group of mothers who gave birth at a relatively old age, fifteen children were born. Of which, eight were nourished with cow milk formula, three were nourished with specialized formula, and three with goat milk formula. Both, relatively young and old mothers used different types of formula. In both groups, cow milk formula is the most commonly used type of infant formula. Which aligns compared to a study from Rossen et al. (2016) which reported, approximately 69%, of the consumed infant formula is cow-milk based. When specifically looking at goat milk formula, it can be indicated, relatively young and old mothers, do not have a preference for goat milk formula. Overall, there is no difference in usage of infant formula among relatively young and old mothers.

In addition, the relationship between the participants level of education and the type of infant formula used to nourish their children was examined in the study. The findings, displayed in figure 3, revealed patterns for type of infant formula compared to the specific level of education. Participants who finished higher middle school or college, exclusively used cow milk formula to nourish their children. From the participants who attended University of Applied Sciences, three children got nourished with cow milk formula, five children got nourished with

specialized formula and two got nourished with goat milk formula. Participants who finished University or higher, three children got nourished with cow milk formula, and two with goat milk formula. To look at the picture as a whole, higher educated participants, used goat milk infant formula occasionally. Displaying a trend in the usage of goat milk infant formula usage amongst higher educated participants.

The analysis of geographical area of the participants in relation the type of infant formula revealed trends. From the results, displayed in figure three, it can be observed, cow milk formula is the most commonly used type of formula amongst the groups, aligning with previous research (Rossen et al., 2016). In addition, the interviews revealed there is high usage of goat milk formula in urban areas, when compared to the usage among less dense populated areas. Indicating a specific openness towards an alternative type of infant formula amongst participants from urban area's.

Figure 4 displayed in the results section relates different factors against each other. As explained, cow milk formula is the most common used type of infant formula among participants.. It can be observed, higher educated participants, who studied University of Applied Science or University, and live in an urban area are most likely to buy goat milk formula. Moreover, participants with a lower level of education, living in all geographical areas tend to be more likely to nourish infants with cow milk formula exclusively.

4.2. Consumer perception

The following section discusses the results of the second sub-question ‘What is the perception on goat milk infant formula among mothers in the Netherlands?’. Aiming to explore the perception on goat milk infant formula among mothers in the Netherlands. The interviews revealed, only four out of ten mothers knew of existence of goat milk infant formula. From which three out of the four mothers had knowledge about the product, due to a job, or previous job related towards the goat milk formula industry.

Overall, the interviews indicated participants have different perceptions on goat milk formula. Figure four, displays different perceptions, identifying, positive, negative and neutral perceptions. Altogether, half of the participants have the perception goat milk formula is more healthy alternative when compared to cow milk formula. Another positive perception is the digestibility of the product. Three participants consider goat milk formula as easily digestible for infants. When comparing the statement with literature, it is in line with previous research from Prosser (2021), were was stated, goat milk formula possibly has a positive impact on gastrointestinal related outcomes when consumed by infants. One positive perception is related towards a more natural product when compared to cow milk formula.

A small number of participants had a negative perception about goat milk formula. The negative perception can be related towards the high price of goat milk formula. Which is in line with the current market prices of goat milk infant formula (Babyvoedingchecker, 2023). One compares goat milk formula with the dirty smell of goats. Three participants have no or a neutral perception on goat milk formula, due to the fact the participants have no knowledge about the product.

The results indicate that awareness and knowledge about goat milk formula among participants is limited. Even though knowledge is limited, participants have various perceptions about goat milk formula. Overall, participants have positive perception about goat milk formula, with healthiness and high digestibility, as the most common perception of goat milk formula. The findings suggest a need for further promotion, and education, to increase awareness and knowledge about the existence of goat milk formula among mothers in the Netherlands.

4.3. Preference for Sales Channel and willingness to purchase

This section discusses the results based on the findings of the last sub-question ‘What are the preferences for sales channel and willingness to purchase goat milk formula among mothers in the Netherlands?’. The aim of this sub question is to provide companies operating in the infant formula industry with insights into preference for sales channel, and willingness to purchase goat milk infant formula.

First, the preferences for sales channel are discussed. The results, indicate there are different opinions regarding the preferred sales channel for goat milk infant formula. Overall, the participants explained to prefer three different options to buy goat milk infant formula. Including, buying the product exclusively online, exclusively in a physical store, or a hybrid approach between in a physical store and online.

The least preferred option is the exclusive online sales channel, only one participant indicated to prefer the exclusively online channel only. Some participants, three out of ten, prefer a traditional shopping experience in the physical store. The preferences for physical store are influenced by factors such as the need to physically interact with the product, supporting local businesses, or the habit of purchasing food-related products in the supermarket.

Most participants expressed to prefer the option to buy goat milk infant formula, online in combination with physical store. The participants would like to have both options due to convenience of the sales channels. For example, participants find it convenient just grab a product in the supermarket while doing regular groceries. The combination of online and physical store options provide flexibility and accessibility to the product. By offering a combination between online, and a physical sales channel, businesses operating in the infant formula industry are able to meet the preferences for sales channel among mothers living in the Netherlands.

Next, the willingness to purchase goat milk infant formula is discussed. The research identified several factors influencing the willingness to purchase goat milk formula, and the overall willingness to purchase goat milk formula. The willingness to purchase goat milk formula is influenced by several factors, displayed in figure 7. Price or affordability is the most frequent factor, during interviews, over half of the participants mentioned the importance of a competitive price. Whereafter the product's availability, plays an important role on the willingness to purchase. Some participants mentioned to switch to a different type of infant formula if the current products becomes unavailable. According to Doherty et al., (2022) during

recent decades, unavailability of infant formula has played a role in the international market, when factory in the United States was closed.

Some participants primarily are only willing to buy an a-brand from well-known manufacturers, or prioritize the functionality of the products. Factors having a minor impact on the decision of participants include the convenience of the packaging, personal background, and advice from healthcare professionals. The most common bottleneck for the willingness to buy goat milk formula are high prices. Which can be strengthened by the current market prices. According to Babyvoedingchecker (2023), the price of goat milk formula currently almost lays at double the price for a kilo compared to goat milk formula.

4.4. Reflection on the research.

For the research, a qualitative method was used to obtain in-depth knowledge on demographics, consumer perception, preference for sales channel, and willingness to purchase goat milk formula of participants. Interviews were conducted as part of the research, the process during the interviews went well. Participants were open about experiences, and perceptions, providing insightful information for the study. The positive experiences during the interviews increased the overall quality of the study.

As mentioned in the materials and methods section, the research includes demographical aspects, such as, age, level of education, geographical location, and nationality. However, during recruitment of the participants, mothers with only the Dutch nationality responded. Therefore, the research has no insights based on results of the influence from different nationalities on goat milk infant formula, resulting in a limitation.

It is important to highlight that in a follow-up study, a more diverse group of participants specifically looking at nationality or race should be included. Including a more diverse group of mothers would enable a more comprehensive analysis, and gain a deeper understanding of consumer behavior among mothers from different nationalities. In addition, a follow-up study could be quantitative and including a larger sample size, to be able to get a more clear picture on how often specific types of influences, perceptions, or preferences are occurring (Goetzen, 2023).

5. Conclusions and recommendations

The aim of the research is to find out what the consumer acceptance of goat milk formula among mothers living in the Netherlands is. To find an answer, a recruitment survey was published, which recruited ten mothers. Whereafter ten interviews were conducted to obtain insights for the research. The research found insights into three main topics related to goat milk infant formula: demographical influence, consumer perception, and preferences for sales channels & willingness to purchase.

Among the ten participants, three different types of infant formula were used, cow milk formula, specialized formula, and goat milk formula. Overall, cow milk formula is the most common used type of infant formula, there is no preference for goat milk formula, except from occasional usage. The research identified there is no relation between older, and younger mothers in relation to the usage of types of infant formula. When comparing education level, it can be concluded there is a trend in the usage of goat milk formula. Participants who attended University of Applied Sciences or University are more likely to use goat milk infant formula to nourish their infants. In contrast, participants with a lower level of education tended to exclusively use cow milk formula to nourish infants. Cow milk infant formula is most commonly used across all geographical areas. Participants from urban areas have a higher usage of goat milk formula compared to less densely populated areas. Connecting different demographical aspects, the most common participant to buy goat milk formula is a higher educated mother living in an urban area.

Interviews demonstrated that the awareness and knowledge of goat milk formula among mothers living in the Netherlands is limited. All mothers have different perceptions on goat milk formula. It can be concluded that most perceptions on goat milk infant formula are positive, goat milk formula is seen as an healthy and highly digestible product. Negative perceptions highlight, relatively high prices of goat milk formula compared to cow milk formula.

Dutch mothers are open towards purchasing goat milk infant formula. Competitive pricing, and availability are identified is key factors influencing the willingness to purchase goat milk formula. Potential barriers towards purchasing goat milk formula, are the high prices. In addition, well-known A-brands are often preferred compared to a fairly new product such as goat milk formula. It can be concluded, Dutch mothers prefer a combination of both, online and

a physical option to buy goat milk infant formula. As result from reasons such high convenience with purchasing, and high accessibility towards the product.

Overall, the general acceptance of goat milk formula among mothers in the Netherlands appears to be moderate. Most Dutch mothers have a positive perception on goat milk infant formula, consider goat milk formula as healthy alternative to nourish infants. However, most mothers have no or limited knowledge of the existence of the product. In addition, Dutch mothers still prefer cow milk formula. Despite having limited knowledge of the product, Dutch mothers are still open to purchase goat milk infant formula. Indicating a potential for goat milk infant formula on the Dutch market.

Based on the results and conclusions, short, and long-term recommendations can be made towards companies involved in the sale of goat milk infant formula. In the short-term, marketing departments should initiate campaigns targeting, Dutch mothers of all ages with a high level of education living in urban area's. To meet the preference for sales channel of Dutch mothers, products should be offered both online, and in-store. Continuous availability of the products, can help to increase further acceptance of goat milk formula. In addition, both in short and long-term, companies should initiate campaigns aiming to create awareness on the existence of goat milk formula. On the long term it is recommended, companies should focus to obtain a more competitive price compared to cow milk formula.

By focusing on these recommendations, companies can effectively target key consumer segments, enhance product availability, and raise awareness, ultimately creating a higher level of acceptance of goat milk formula.

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Appendix I; Recruitment survey.

Are you a mother living in the Netherlands and did you give birth in or after 2002?
Would you be willing to offer 10-20 minutes of your valuable time during an interview, to help me with my graduation project? Please fill out this survey.

The objective of the interviews is to gather insights about consumer behavior of Dutch mothers within the Dutch infant formula market. Having insights in consumer behavior will contribute to the development of my bachelor thesis.

Data gathered from the interviews will be anonymized in the final report

Completing the questionnaire will take up to 4 minutes.
Thank you sincerely for the help and valuable time!

1. *In which year(s) did give birth? (Write as; 2013, 2015, 2016)*
   In welk(e) jaar/jaren zijn uw kind(eren) geboren? (Schrijf als; 2002, 2004, 2008)
   a) ……...
2. *How old were you when you gave birth? (Write as; 29, 32, 34)*
   Hoe oud was u bij de geboorte van uw kind(eren)? (Schrijf als; 29, 32, 34)
   a) ……
3. *What is the highest level of education you finished?*
   Wat is uw hoogst genoten onderwijsniveau?
   a) *Lower middle school,* VMBO
   b) *Higher middle school,* Havo, Vwo of Gymnasium
   c) *College,* MBO
   d) *University of applied sciences,* HBO
   e) *University or higher,* Universiteit of hoger
4. *Do you live in a urban, Sub-urban or rural area?*
   Woont u in een stedelijk, voorstedelijk of landelijk gebied?
   a) *Urban (25000 or more inhabitants),* stedelijk (25000 of meer inwoners)
   b) *Suburban (100 – 25000 inhabitants,* voorstedelijk (100-25000 inwoners)
   c) *Rural (Outside city borders),* landelijk (buiten de stads/dorps grenzen)
5. *What is your current nationality?*
   Wat is uw huidige nationaliteit?
   a) *Dutch,* Nederlandse
   b) *Other,* anders, …….

c) *Prefer not to say, ….. .....*

6. *Where can I reach you for the interview?*

   Hoe kan ik u bereiken voor de interviews?

   a) *E-Mail …..*

   b) *Phone-number,* Telefoonnummer, …..

Appendix II; Interview Structure

English; interview structure.

The interviews start with a short instruction of myself, the objective of the research, and the participant will be asked to introduce herself. Whereafter the following predetermined interview questions will be asked.

1. How did you nourish your infant(s) during the first year? (0-12 months)
    a. If; infant formula was used, which type of formula did you use?
2. What influenced your decision to breastfeed or to use infant formula?
3. What influenced the decision (not) to use goat milk infant formula?
    a. In which way did this factor influence your decision (not) to use goat milk infant formula?
4. Did you know about the existence of goat milk infant formula?
5. What do you currently know about goat milk infant formula?
    a. What benefits or disadvantages do you associate with goat milk infant formula?
6. What is your feeling towards goat milk infant formula?
7. With your current knowledge, would you be willing to purchase goat milk infant formula? (imagine you would have a child today)
    a. Why would you (not) be willing to purchase goat milk formula?
        i. Is it due to higher price, availability, etc?
8. What would be the preferred sales channel if you were to buy infant formula today?
    a. Why do you prefer this sales channel?
9. As which racial or ethnic identity do you identify?
    a. African-American/Black
    b. Asian
    c. Middle Eastern
    d. Native American/Indigenous
    e. European, American/White Caucasian

Dutch; interview structuur.

Het interview begint met een korte introductie over mezelf, het onderzoek en de deelneemster wordt kort gevraagd om zich voor te stellen. Waarna de volgende vooraf vastgestelde interviewvragen aan de deelneemster worden voorgelegd.

1. Hoe heeft u uw kind(eren) gevoed gedurende het eerste levensjaar? (0-12 maanden).
    a. Als u flesvoeding heeft gebruikt; Wat voor type flesvoeding heeft u gebruikt.
2. Wat beïnvloedde uw keuze om borstvoeding of flesvoeding te gebruiken?
3. Wat beïnvloedde de beslissing om wel of geen geitenmelk flesvoeding te gebruiken?
    a. Op welke manier heeft deze factor uw beslissing beïnvloed om wel of geen geitenmelk flesvoeding te gebruiken?
4. Wist u van het bestaan van geitenmelk flesvoeding?
5. Wat weet u momenteel over geitenmelk flesvoeding?
    a. Welke voor en/of nadelen associeert u met geitenmelk flesvoeding?
6. Wat is uw gevoel bij geitenmelk flesvoeding?
7. Met uw huidige kennis, zou u bereid zijn om geitenmelk flesvoeding te kopen? (Stel uzelf voor dat u op dit moment een kind zou hebben.
    a. Wat is de reden dat u wel of geen geitenmelk flesvoeding zou kopen?”
        i. Is dit door hogere prijzen, beschikbaarheid, of andere redenen?
8. Wat is uw voorkeur voor verkoopkanaal als u vandaag flesvoeding zou kopen?
    a. Wat is de reden dat u een voorkeur geeft aan dit verkoopkanaal?
9. Met welke etniciteit identificeert u zich?
    a. Afro-Amerikaans/Zwart
    b. Aziatisch
    c. Midden-Oosters
    d. Inheems-Amerikaans/Inheems
    e. Europees, Amerikaans/Wit-Kaukasisch
    f. Anders ….

Appendix III; Demographic data of participants

Table 1

Participant	Current Age	Age During Birth	Children's Birth Year	Geographical Area	Highest level of Education	Formula Choice
1	53	33, 35, 38	2002, 2004, 2008	Rural	University of Applied Sciences	Cow Milk Formula
2	60	35, 37, 39	1998, 2000, 2002	Suburban	Higher Middle School	Cow Milk Formula
3	49	31, 34	2004, 2008	Suburban	University of Applied Sciences	Specialized Formula
4	39	29	2014	Urban	College	Cow Milk Formula
5	40	30, 32	2014, 2015	Urban	University of Applied Sciences	Goat Milk Formula
6	34	30, 32	2019, 2021	Urban	University or higher	1st Cow & 2nd Goat Milk Formula
7	47	29, 30, 34	2005, 2006, 2010	Rural	University or higher	1st and 2nd Cow & 3rd Goat Milk Formula
8	56	31, 34, 40	1998, 2001, 2007	Rural	University of Applied Sciences	Specialized Formula
9	36	31, 32, 34	2018, 2019, 2021	Suburban	College	Cow Milk Formula
10	62	41	2002	Rural	College	Cow Milk Formula