

## School milk demand: design and first results of the German federal research project „Focus on school milk“

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### Abstract

School milk consumption has declined steadily in Germany. To retrieve quantifiable information on the different influencing factors and to provide approaches to improve the school milk demand, a research project<sup>1</sup> was set up by the German Federal Ministry of Food, Agriculture and Consumer Protection. The main objective is to evaluate the impact of factors like price, attitudes and habits (especially consumption habits), social background, gender, economic situation, knowledge; product range and distribution form, as well as of nutritional education measures. Schools located in North Rhine Westphalia were selected by stratified random sampling. The impacts of prices are derived in a price experiment in which the price of school milk was reduced stepwise during the school year 2008/09, and increased over the school year 2009/10, while quantities of demand are reported regularly. Almost all other information/data is captured by questionnaires given to pupils, parents, class teachers, school principals, school milk managers, and delivery firms, with a focus on the consumption of dairy products, attitudes towards school milk and milk in general, acceptance of the school milk program, distribution problems throughout the chain as well as on the handling. This article presents the design and first descriptive results.

*Keywords: School milk, influencing factors, demand, subsidy*

<sup>1</sup> The Federal Ministry of Food, Agriculture and Consumer Protection commissioned the Department of Nutritional Behaviour of the Max Rubner-Institute (MRI) and the Institute of Market Analysis and Agricultural Trade Policy of the Johann Heinrich von Thünen-Institute (vTI) to conduct this research in close cooperation. Due to the specific expertise in social sciences and nutritional behaviour, the responsibilities of the MRI in this research are the development of questionnaires used in the surveys and of nutritional education measures, the carrying out of the respective surveys, and the analysis of the data as well as to provide relevant data for a quantifiable demand model. Responsibilities of the vTI are based on its expertise in analysing the agricultural and food markets including demand and supply. Thus, the vTI's experience covers demand models, issuing supply-side surveys and the development of questionnaires, respectively. The work of the vTI is focused on conducting the price experiment. In this context, the vTI is responsible for the collection and the analysis of the demand data, as well as the estimation of the demand models.

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### Zusammenfassung

#### **Die Nachfrage nach Schulmilch: Konzeption und erste Ergebnisse des deutschen Bundesmodellvorhabens „Schulmilch im Fokus“**

Der Konsum von Schulmilch ist an deutschen Schulen stetig zurückgegangen. Um quantifizierbare Informationen über die verschiedenen Einflussfaktoren sowie Lösungsansätze zur Verbesserung der Schulmilchnachfrage zu erhalten, wurde vom Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz (BMELV) ein Modellprojekt initiiert. Bei diesem soll in erster Linie der Einfluss von Faktoren wie beispielsweise des Preises, verschiedener Einstellungen und Verhaltensweisen, insbesondere des Ernährungsverhaltens, des sozialen Umfeldes, des Geschlechtes, der ökonomischen Situation, des Wissensstandes, der Produktpalette, des Distributionsweges sowie Informationsveranstaltungen gemessen werden. Hierfür wurden Grundschulen in Nordrhein-Westfalen mittels einer geschichteten Zufallsstichprobe ausgewählt. Der Preiseinfluss wird mit Hilfe eines Preisexperimentes ermittelt, in dessen Rahmen der Schulmilchpreis während des Schuljahres 2008/09 schrittweise gesenkt und im Schuljahr 2009/10 schrittweise wieder angehoben wurde. Die bestellten Schulmilchmengen wurden regelmäßig von den Schulen gemeldet. Nahezu alle anderen Informationen/Daten wurden mit Hilfe von Fragebögen erhoben, die von den Schülern, Eltern, Klassenlehrern, Schulleitern, Schulmilch-Koordinatoren sowie den Schulmilchanbietern ausgefüllt wurden. Hierbei lag der Fokus auf dem Konsum von Milchprodukten, den Einstellungen gegenüber Schulmilch und Milch im Allgemeinen, der Akzeptanz des Schulmilchprogramms, Distributionsproblemen wie auch der allgemeinen Handhabung. Im Rahmen dieses Artikels werden erste deskriptive Ergebnisse präsentiert.

*Schlüsselwörter: Schulmilch, Einflussfaktoren, Nachfrage, Beihilfe*

## 1 Introduction

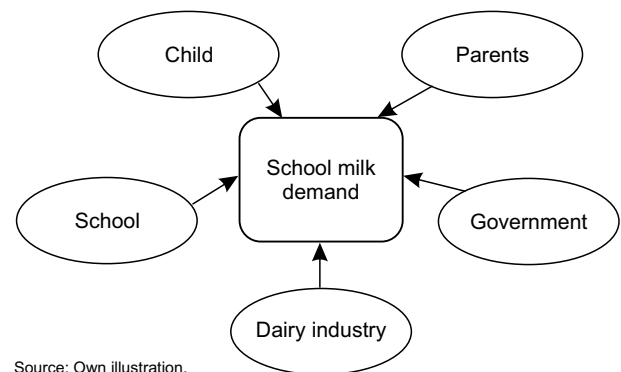
A balanced diet is a basic need, especially for children. Dairy products are a part of such a diet (Heine 1999) due to the animal protein, vitamins and minerals they contain. School milk sales have a very long tradition because it is one way to cover the basic daily nutritional requirements of children. The present design was essentially established as a consumption aid by the European Union in 1972 (VO (EWG) No. 1080/77). The project had however, two additional objectives: on the one hand, it was a good tool for improving the nutritional situation of children; on the other hand it was an easy way to win new consumers. Today, the main intention is to encourage the consumption of dairy products. Therefore, all children visiting a nursery school, or a primary or secondary school, are entitled to receive a maximum quantity of 250 ml of subsidized school milk or milk equivalents per school day. Subsidized prices of school milk follow a maximum price policy. In Germany, maximum prices are fixed by the federal states and, in return, distributing firms are granted a subsidy in compliance with some regulations. Since 1993, the school milk subsidy was reduced to its current level of 18.15 cents per kg. Declining shares of school milk demand accompanied this reduction. At present, 300,000 tonnes of milk equivalents are consumed within the framework of the EU's school milk programme, of which 41,000 tonnes are consumed by German children.

Manifold are the reasons for the decline in milk consumption. The attitudes of parents and children towards milk and milk products, their preferences and tastes, their habits towards a healthy diet, changing eating habits and preferences are discussed. But also the adequate packaging, waste or school's problems in handling the milk are mentioned. Declining numbers of dairy firms engaged in producing the school milk supply have made school milk less accessible, since the less profitable school milk production line could not always be retained within the concentration process of the German dairy industry. In addition, the product range of school milk is limited. Financial pressure has reduced the technical staff at schools over time, thus causing a decline in the number of people who are willing to distribute and sell school milk.

## 2 Aim and research question

The demand for school milk is affected by agents taking part in the school milk chain (compare Figure 1): the child drinking or refusing school milk, its parents, the school with its principal, the teachers, and the school milk manager, the dairy industry and, last but not least, the state. Involved decision-making units (also called agents) have different interests in school milk; they also differ in their

attitudes towards and their knowledge of the product. Just as with other products, they are able to influence production, distribution and consumption in various ways and with different impact, and they also interact. Until now, the strength of interaction is mostly just discussed but rarely proven and quantifiable information on interactions is also lacking.



Source: Own illustration.

Figure 1:  
Agents influencing school milk demand

Scientific literature regarding school milk is rather limited. In Germany, two studies have been conducted and reported so far. Wietbrauck (1976) investigated the factors for decreasing school milk consumption with the objective of a proposal for school milk systems that keep school milk consumption at a higher level. The study concludes that school milk consumption can be influenced by the product range at schools, the milk temperature and marketing measures of dairies, of the government and other organisations. Later on, Weindlmaier and Fallscheer (1997) analyzed the organisation and cost of school milk marketing in Germany as well as the attitudes of school personnel and pupils regarding school milk. Several problems have been detected: a complicated school milk subsidy scheme, high cost related to school milk production and distribution, higher margins for other products sold at schools, steadily decreasing number of adults to organize the selling of school milk products.

However, those findings are quite outdated and since then demand has declined further. Thus, the aim of this project is to identify factors which influence school milk demand. As an important driver, consumer prices, determined for the most part by the state, must be taken into account. Other likely determinants to be examined are nutrition education, socio-economic status and location (rural/urban area). Further potential impact factors are to be selected and their influence is to be explored in order to gain data for the development of a quantifiable demand model.

To retrieve current data on influencing factors on school milk demand along the school milk chain, the German Federal Ministry of Food, Agriculture and Consumer Protection set up a project "Focus on school milk" in North Rhine Westphalia, in cooperation with the Ministry of the Environment and Conservation, Agriculture and Consumer Protection of North Rhine Westphalia. Results hereof should be a base for developing future school milk policies.

The project is divided into a main project conducted in North Rhine Westphalia, and into several satellite projects also including other German federal states or Germany as a whole. This article will only address the main project. Primary schools were included in the main project, divided into two different samples: (1) a 'classes' sample' providing data on demand at the class level and (2) a 'pupils' sample' with data on demand and other data such as nutritional behaviour and attitudes at individual level. All data collection at schools is restricted to class levels two, three and four.

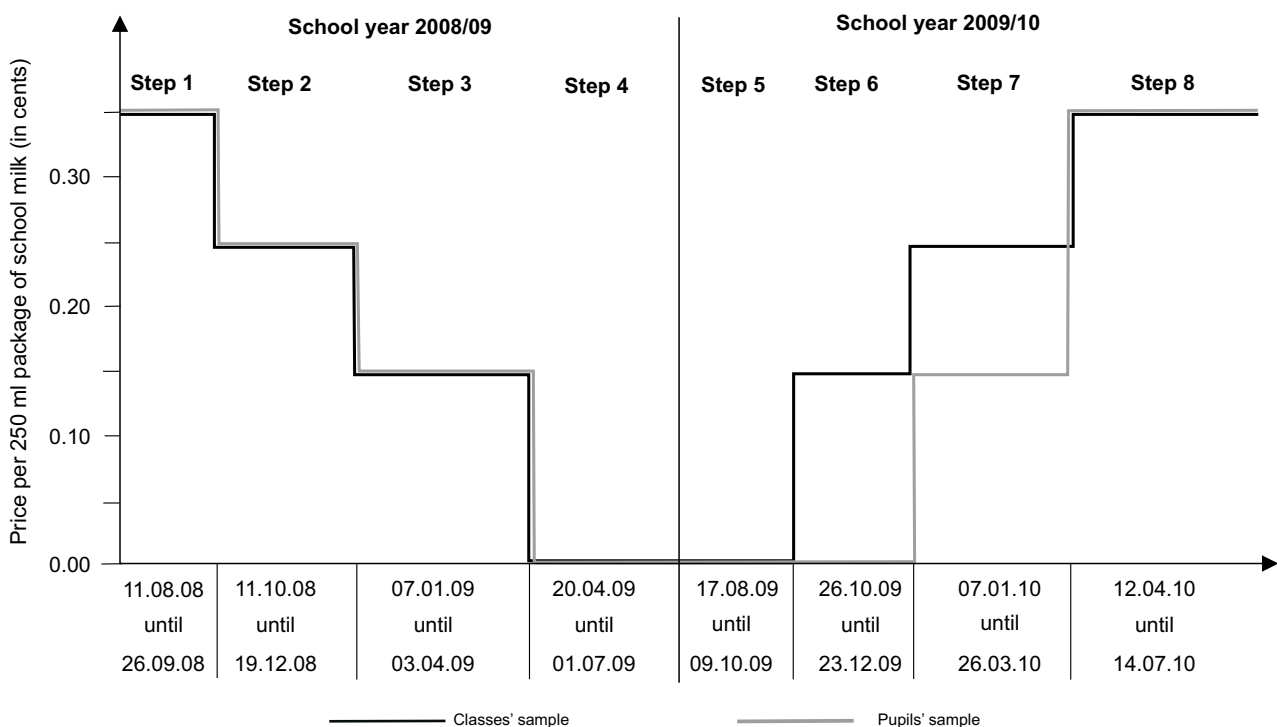
The paper is structured as follows: first, a general description of the project is given, including the price experiment conducted and different samples drawn to compile the relevant data. Then, in section four some selected first descriptive findings based on the analysis of the first three,

respectively, four, price steps in school year 2008/09 are shown. A final section provides a summary and some preliminary conclusions.

### 3 General design of the research project

#### 3.1 Price Experiment

The main project includes a price experiment allowing for a quantification of price, respectively subsidy effects, on school milk demand. Prices were standardised in Price Step 1 and then reduced in three additional price steps in school year 2008/09 and are increased in two price steps in the pupils' sample or in three steps in the classes' sample, respectively, to again reach the original price level in Price Step 8 in school year 2009/10. In the participating schools, the price of school milk (250ml) was gradually reduced during school year 2008/09 from 35 cts<sup>2,3</sup> (Price Step 1) to 25 cts (Price Step 2) and 15 cts (Price Step 3) to 0 cts (Price Step 4). Prices were increased again during the school year 2009/10 as shown in Figure 2. To prevent strategic behaviour, those price steps were not announced in advance.



Source: Own illustration.

Figure 2: Prices of school milk during the price experiment

<sup>2</sup> Euro cents.

<sup>3</sup> Price of non-flavoured school milk was 30 cts/250 ml. From the second to the seventh price steps, pure and flavoured milk are charged for the same price.

During the school year 2008/09, participating schools periodically reported school milk quantities ordered at class (classes' sample) or individual level (pupils' sample). However, in the following school year 2009/10, only information at school level was compiled comprising all classes of the school regarded. Demand was differentiated by flavours. As additional demand information, data on class sizes, gender, and immigration background share, population size of the town and the socioeconomic status of the district was collected. Socioeconomic status acknowledges that the social burden (share of people with immigration background, of unemployed persons, as well as persons requiring social welfare assistance or the share of apartments in residential houses) in each district may differ.

### 3.2 Samples

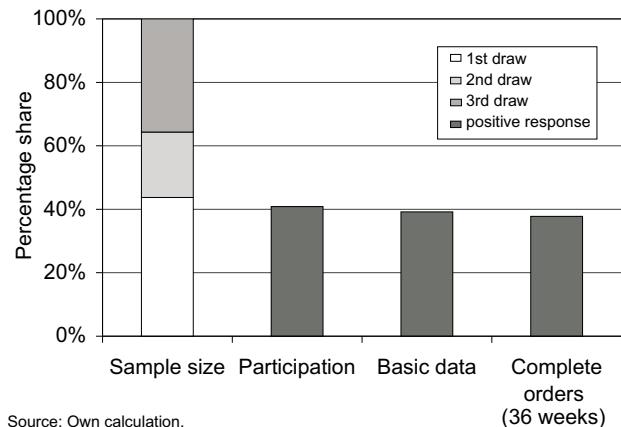
Sampling units for this project were primary schools chosen from the total set of all primary schools in North Rhine Westphalia.<sup>4</sup> The sample was drawn randomly in a multi-stage sampling procedure taking different strata into account. As characteristics of the stages in that process the socioeconomic status of the district derived from the spending on welfare aid at county level, the share of pupils with a migration background and former participation or non-participation in the EU school milk programme were considered. However, participation in the price experiment and the related surveys were optional. The pupils' sample was drawn in a first step.

#### 3.2.1 Pupils' Sample

Three draws were necessary to reach the desired amount of schools. First, 125 schools were contacted, in a second draw 59 schools, and in the third draw, 102 schools. Ultimately, 116 schools agreed to participate. 112 of those schools sent back the basic data about the different classes within the schools. 108 submitted complete school milk orders for the school year 2008/2009. Approximately 17,700 pupils in class levels two, three and four are covered in the project.

The application of self-administered questionnaires was chosen to gain data for variables included in the demand model as well as to identify additional driving factors on school milk demand. As children have a considerable purchasing power and also increasing influence on purchasing behaviour at family level, the questioning of children was found to be of great importance (Barlovic 1999). The restriction to class levels two, three and four was due to the pupils' lack of reading and writing abilities in class

one. Different questionnaires were developed for pupils, their parents, class teachers, the school principals and the school milk managers. In general, the questionnaires contained questions on nutritional behaviour, consumption preferences, attitudes towards healthy nutrition, milk and school milk, ideas about the school milk programme (promoters and barriers) and suggestions for improvement, knowledge about nutrition and milk as well as socioeconomic indicators.



Source: Own calculation.

Figure 3:

Participation of schools and available demand data in the pupils' sample

Questionnaires for school personnel (school principals and school milk managers) additionally contained questions on food, meals and specifically milk offered at the schools, organisation of the school milk distribution, decisions on the product range, attitudes towards milk and school milk and educational offerings on nutrition and milk by the school.

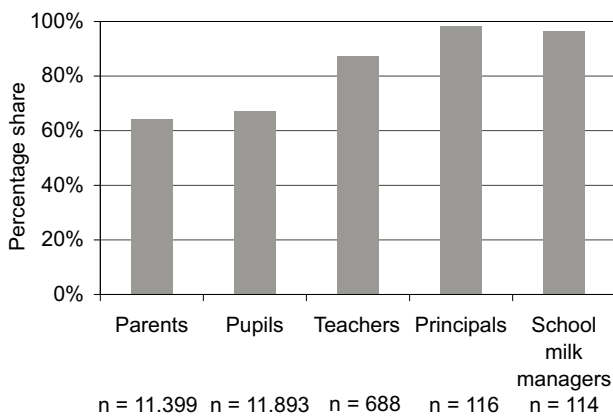
Questions were either developed specifically for this survey or used from other surveys, such as the German Health Interview and Examination Survey for Children and Adolescents (Kurth 2007). To examine attitudes, all respondents except children, were requested to rank statements from "totally disagree" to "totally agree" using a five-point Likert scale. All questionnaires underwent pre-testing. Moreover informational letters were developed explaining this research. The survey procedures included information on the protection of data privacy. The parents' written consent was obtained prior to interviewing the pupils. Questionnaires, letters and forms of parents' consent were also provided in Turkish.

Data collection took place in the beginning of the school year 2008/09 and was conducted by 33 trained interviewers. The interviewers recruited were nutrition professionals with additional experience in dealing with school classes. They also completed a special training for this research. Depending on the number of classes in the respective

<sup>4</sup> 3,392 primary schools with 737,455 pupils.

schools, the interviewers were responsible for three to six schools in different districts. In each school data collection was initiated with an informational meeting with school personnel. Interviewers were also in charge of distributing information material and questionnaires to the interviewees, including the collecting of completed questionnaires and their return to the project leaders. These interviewers assisted the pupils in filling out the questionnaires in the classroom, explained questions and guided the children through the questionnaires. Interviews quality checks were carried out randomly.

The response rates to questionnaires ranged from 64 % to 97 %, depending on the different groups questioned (see Figure 4). Response rates assumed for estimating sample size are exceeded.

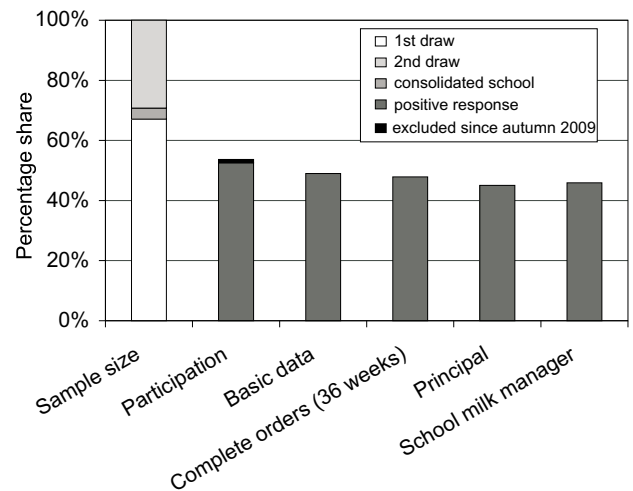


Source: Own calculation.

Figure 4: Response rates of questionnaires of the different groups in the pupils' sample

### 3.2.2 Classes' sample

Two draws of 475 and 207 schools, respectively, were necessary to reach the desired amount of schools within the classes' sample. A total of 26 consolidated schools were added in the beginning of the school year 2008/09. The reasons for that were billing problems of dairy firms, if a school participated but its consolidated partner did not. Finally, the classes' sample consisted of 373 schools of which 348 delivered the basic data. 340 of them submitted complete school milk orders for the school year 2008/09. The questionnaires were filled out by 320 school principals and 326 school milk managers. After a validation process, a sum of approximately 2,800 classes was analyzed.



Source: Own calculation.

Figure 5: Participation of schools and available demand data in the classes' sample

### 3.3 Data on deliveries at school level

Due to practical reasons, participating schools themselves no longer reported data on school milk quantities ordered in the school year 2009/10. Instead, only data on school milk quantities delivered at the school level was made available on a monthly basis, either by respective firms, or if impossible, by the auditing agency of the school milk subsidy<sup>5</sup>. This data source has its limitations as no individual or class data are gained. Furthermore, pooled data on school basis derived from the pupils' and the classes' samples are not comparable as first classes and combined classes were not covered in those samples and, sometimes school milk managers ordered some surplus amounts to improve handling. Due to these limitations, the set of data cannot be combined with the pupil and classes' sample. The data is compiled for school year 2008/09 (Price Steps 1 to 4) and for school year 2009/10 (Price Steps 5 to 8), respectively. This data comprises only a restricted set of information, but nevertheless some limited analysis on price impacts is feasible.

Altogether, information from 12 school milk suppliers is available, classified according to the distribution scheme into manufacturing dairies, milk producers and distributing firms (see Table 1). It should be mentioned that not all of the data delivered by these firms could be related to the classes' or the pupils' sample. In total, the observed firms could potentially provide 112,259 pupils with school

<sup>5</sup> Landesamt für Natur, Umwelt und Verbraucherschutz Nordrhein-Westfalen.

milk, whereas most pupils (91.4 percent) could receive their school milk from a manufacturing dairy. Direct sales by milk producer cover 7.4 percent of pupils.

Table 1:  
School milk delivery firms and number of delivered schools and pupils

Type of firm	Number of schools delivered	Number of allocated schools	Number of pupils supplied
Manufacturing dairies	459	447	102,605
Milk producers	36	35	8,296
Distributing firms	5	5	1,358
Total	500	487	112,259

Source: Own calculation.

### 3.4 Nutritional education measure

As a potential influencing factor on school milk demand, a nutritional education measure carried out in schools by „LandFrauen“<sup>6</sup> (women who live in rural areas, are engaged in communal work and had passed a specific teaching training) was included in this study. The content of the nutritional education measure within the framework of this project was based on teaching units carried out by LandFrauen throughout North Rhine Westphalia prior to the project. The teaching units were carried out once in each school class in school year 2008/09 and equally distributed over the first four price steps. A control group was included in which teaching units were not carried out. This study design allows the comparison of children participating in the teaching units with children not participating and the examination of the impact of the teaching units on school milk demand at different price levels. Based on the random sampling, 88 schools participated in the nutritional education measure (22 in each price step) and 22 schools in the control group without teaching units.

The teaching units focussed on a school breakfast with an emphasis on milk using specific teaching material. Similar types of teaching units are also carried out in other German federal states, which make a transfer of results possible. The teaching units that are usually carried out by the LandFrauen in individual ways with differing core areas were standardised for the project and an outline of the teaching unit developed. The main topics of the teaching units cover some basics on nutrition and the importance of breakfast, and mention of the main food groups must also be included. After a theoretical part, the pupils produced butter on their own and consumed a healthy self-prepared

breakfast composed of bread, fruit and fresh vegetables. With the meal, fresh milk (1.5 % fat) was served and, additionally, for children who did not like milk, water was provided. The duration of the teaching unit was approx. 100 minutes and was scheduled for the first two school lessons to ensure that children were able to have a joint breakfast during the following school break. In order to examine the impact of the teaching units, a second written interview was carried out at the end of the school year. The questionnaire included questions on the teaching units themselves and repeated questions of the first questionnaire to examine a potential change in knowledge and attitudes. The first interviews were carried out prior to any teaching unit and before any change in school milk price, whereas the second interviews were conducted after the teaching units.

## 4 First descriptive findings

Preliminary results describing the data attained during the first school year 2008/09 are drafted in the following section. The data collection and data processing are still ongoing. Therefore this chapter presents data at the school level reported by the delivery firms covering the Price Steps 1 to 4 and data at class level of the classes' sample, comprising Price Steps 1 to 3. Data from the pupils' sample is not available, yet. More detailed data analysis, including outcome of the pupils' sample as well as estimation results of main influencing factors, will be provided at a later stage. Nevertheless, the analysis already conducted provides first insights.

### 4.1 Findings based on school level data

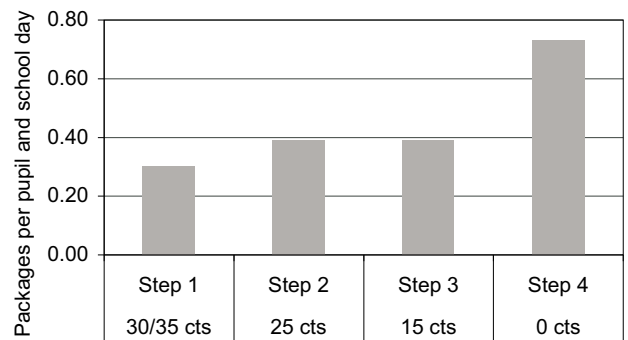
As already mentioned this sample includes aggregated school level data of first class levels and combined classes. Thus the outcome is not comparable with analysis based on data at the more detailed pupils' and classes' sample reported directly, by but will give some overall indications on the main effects.

The results show that the price charged is one of the main drivers in school milk consumption (see Figure 6). In the first price step, the mean consumption was 0.30 packages per pupil and school day, or in other words, on average 30 percent of all pupils demanded school milk at that price. When the price was reduced to 25 cts for all products, the mean consumption share increased to 39 percent. A further price reduction in the third price step caused no additional growth in consumption, which is unexpected at first sight. According to rational consumer behaviour, an increase in demand should be observed. Therefore, other factors might overcompensate price impacts und lead to a stagnation of the school milk demand.

<sup>6</sup> English translation: The Farm Wives' Association.

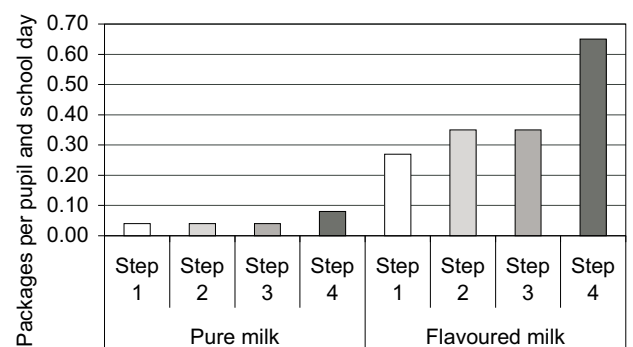
Because the third price period extends from January to the beginning of April, a seasonal influence is easily conceivable. More importantly, milk consumer prices were revised downwards after a maximum in 2007/08. But a detailed analysis will only become available with the analysis of the pupils' sample. When school milk was distributed for free, the mean consumption skyrockets to 73 percent, i.e., a 87 percent increase compared to the third price step. With milk free of charge, almost three-quarters of pupils are interested in school milk.

In general, consumers differ in their preferences, which might well be expected in the case of pupils, too. Therefore pupils may be grouped according to different school milk flavours. However, not all data allow differentiations in the quantities delivered by flavour, and thus only a distinction between unflavoured and flavoured milk is possible (see Figure 7). It is apparent that unflavoured milk is demanded by a minority only. Average school milk consumption of pure milk was only 3.8 percent at the first price step, remaining almost constant at the following steps, and only in Price Step 4 does the share of unflavoured milk consumption increase to 8.1 percent. In contrast, the consumption share of flavoured milk was 26.5 percent at Price Step 1, and increased to 64.7 percent in the last observed price step.



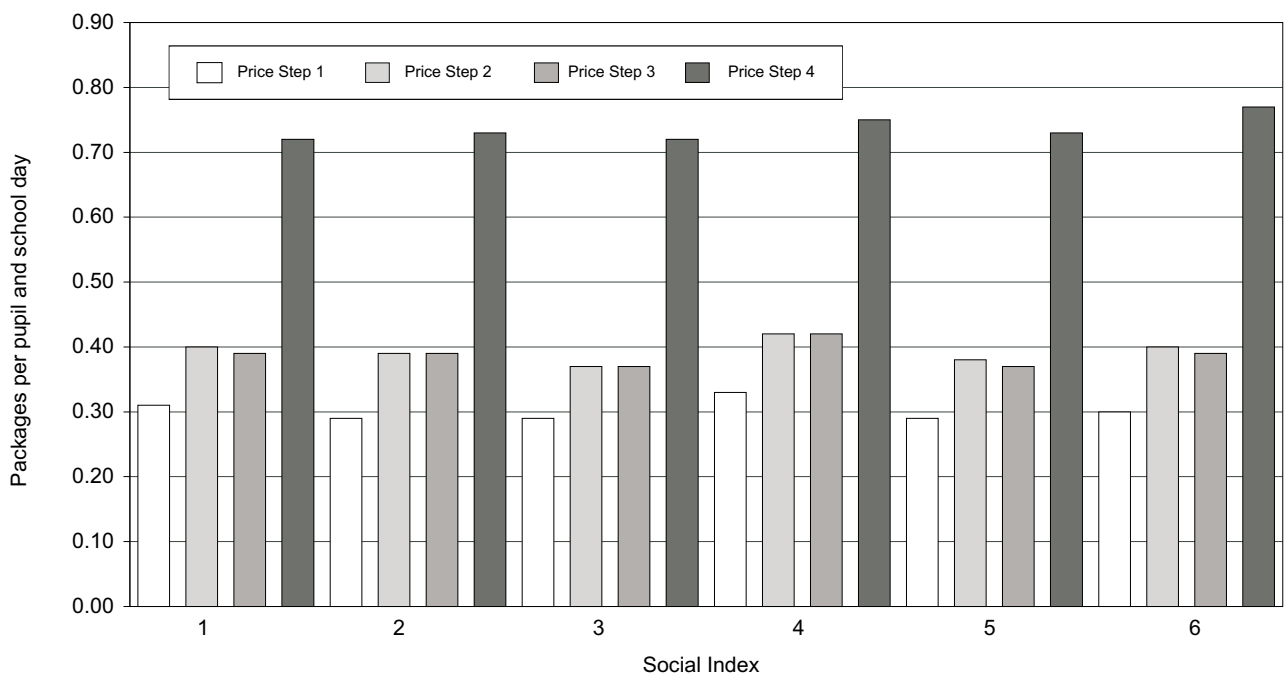
Source: Own calculation.

Figure 6: School milk consumption – school level data



Source: Own calculation.

Figure 7: Trend in school milk consumption differentiated by variety of milk – school level data



Source: Own calculation.

Figure 8: Trend in school milk consumption differentiated by social index – school level data

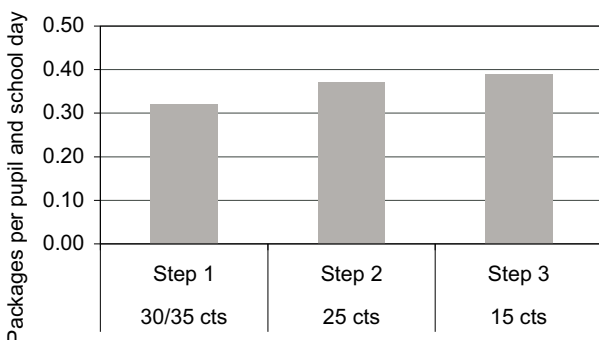


Not only individual preferences but also other economic factors beyond prices might have an impact on demanded quantities. Considering social burden at the county level as a socioeconomic indicator, our results show that school milk demand is dependent on the social economic environment a school is located in, see Figure 8. At Index Level 1 the social burden is the lowest, and at Index Level 6 is the highest. In the first price step (see white columns in Figure 8), some differences in school milk consumption per pupil can already be observed. The highest consumption of 0.33 packages per pupil and school day is shown in Level 4 of the social index, which is just below the medium of the social environment. But when price reductions are taken into account, the core message is that pupils in the weakest social districts benefit most if school milk is contributed free of charge.

4.2 Findings based on classes' sample data

The outcome of this section is based on the classes' sample data which are not directly comparable to the school level data as already described above. Furthermore, this data sample includes only the first three price steps of the experiment. The results, however, are much more differentiated, as additional information is available at the level of classes.

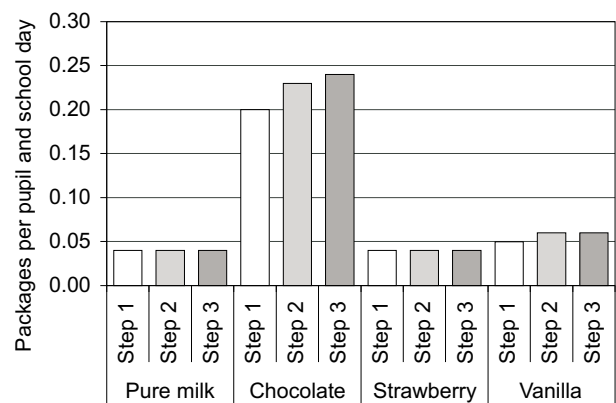
At the initial price level, an average of 32 percent of pupils in classes 2, 3 and 4 consumed school milk (see Figure 9), which is a higher average consumption than derived on school level data, see Figure 6. This figure increased by 16 percent to 37 percent as the price of one package school milk was reduced to 25 cents which is lower than average school level data. In Price Step 3, with a price reduction to 15 cts per package, 39 percent of pupils consumed milk at school, almost the same outcome compared with results achieved at school level.



Source: Own calculation.

Figure 9: School milk consumption – classes' sample data

Consumption depends on consumer preferences, and pupils' milk products demand is no exception. Therefore average consumption differs between the milk flavours offered (see Figure 10). The allocation shows that flavoured milk products contribute most to school milk consumption, with chocolate-flavour the most popular. Thus, approximately 20 percent of pupils demanded chocolate-flavour. In contrast, only 4 percent of pupils drank unflavoured milk, a share comparable to the results based on the school level data. The other flavours like vanilla and strawberry exhibit similar consumption shares over time as pure milk. Along the different price steps the biggest increases could be observed for chocolate-flavour.



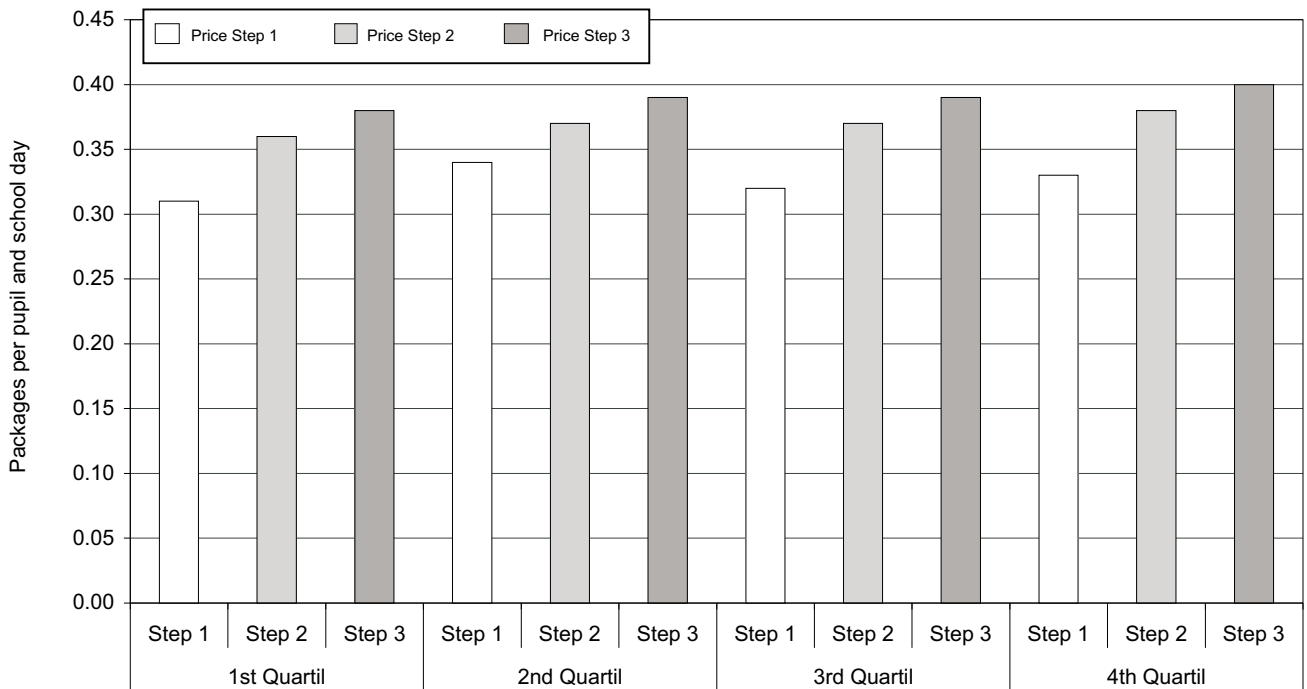
Source: Own calculation.

Figure 10: Trend of school milk consumption differentiated by variety of milk – classes' sample data

For this project, special attention has been drawn to a possible urban-rural division in school milk demand. A first indication can be derived by comparing the size of towns where the selected schools are located. For this purpose all communities were ordered by size and subdivided into four quartiles. The first quartile summarises the smallest communities, whereas the fourth quartile includes the largest towns. The results reveal a slightly higher share of school milk consuming pupils in larger cities (4<sup>th</sup> quartile) compared with the 1<sup>st</sup> quartile (see Figure 11). However, this finding requires further considerations as the impact on demand may also stem from income differences.

Consumption is not only affected by preferences, there is also an influence of age; however, pupils' age was not captured by the data compiled in the classes' sample. Although pupils in a class may be of slightly different ages, the class levels might be used as a proxy for the age. As Figure 12 shows, pupils at higher levels consumed at each price step less than younger pupils. The greatest difference in consumption share is between Class Level 2 and Class Level 4 at price step 1. In total, 40 percent of pupils in

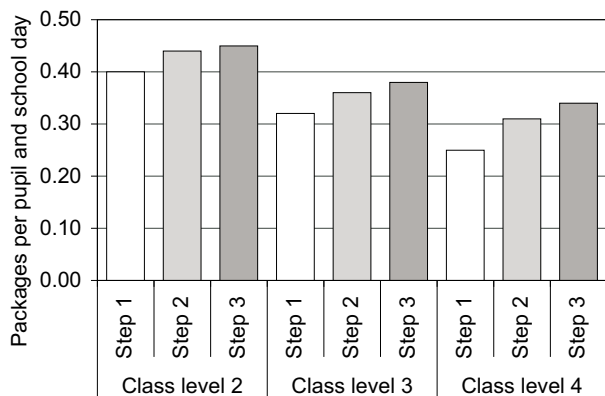




Source: Own calculation.

Figure 11: Trend in school milk consumption differentiated by town size – classes' sample data

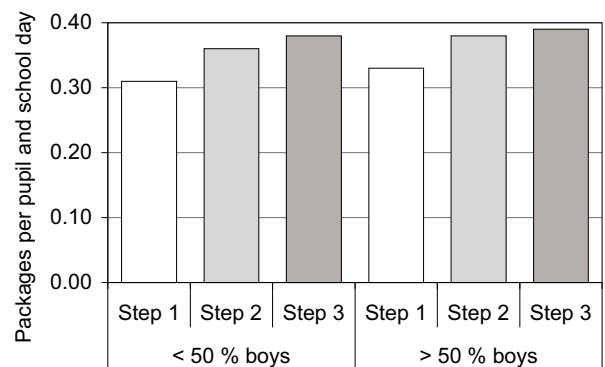
the second school level demand school milk on average at Price Step 1, whereas the corresponding consumer share of the fourth class level year is 25 percent only. With lower prices the impact of the class level becomes smaller, but still remains significant. At Price Step 3 the absolute difference between Class Level two and Class Level four was reduced to 0.11 packages per pupil compared to 0.15 in Price Step 1.



Source: Own calculation.

Figure 12: Trend in school milk consumption differentiated by class year – classes' sample data

Gender differences prove to have an additional influence on school milk demand. In the literature it is often mentioned, that boys show a higher demand for milk and milk products than girls (Mensink et al. 2007). The results in the classes' sample confirm this hypothesis. The consumer share is higher in those classes having a higher proportion of boys (see Steps 1 to 3 in the subsample with > 50 % boys in Figure 13).



Source: Own calculation.

Figure 13: Trend in school milk consumption differentiated by boys' share – classes' sample data

## 5 Summary

This paper describes the research outline and first findings of a federal research project investigating the demand for school milk and its influencing factors in primary schools in North Rhine Westphalia. The analysis of demand reactions to price changes is conducted in combination with a questionnaire survey to identify the determining factors of school milk consumption. Self-administered questionnaires serve as the main source of data for this study. These questionnaires cover primary pupils (classes two to four) and their parents, the personnel at schools (principal, class teacher, school milk manager) and the supply side of school milk (dairies, milk producers and distributing firms). School milk consumption on class level as well as at individual pupil level was reported during the school year 2008/09. Although the project is not finished yet few selected findings are presented here.

With four different price steps throughout the school year 2008/09 the price experiment shows that school milk prices matter. Price decreases from 35 cts to 25 cts and then from 15 cts to 0 cts per package leads – as expected – to an increase in school milk consumption especially when the price was reduced to zero. Maximum school milk demand is identified with a free of charge school milk distribution at a participation rate of 73 percent of all primary school pupils. For different reasons – hypothetically cultural eating and drinking habits, taste, lactose intolerance, and cow's milk allergy – a significant proportion of pupils will not consume milk at all, even free of charge. However, lower prices steps led to limited demand effects which will require further considerations. Whether this reaction is due to a seasonal effect, simultaneous decrease of retail prices or other factors like, e.g., financial crisis or attitudes has to be analyzed in detail at a later stage.

Even though data from questionnaires and reported school milk demand at individual pupils' level could not be combined yet, some main drivers of school milk consumption could already be identified: Age can be seen as important influencing variable as the consumption of school milk decreases with higher class levels. This study also supports the hypotheses that gender differences affect milk demand; boys on average consume more milk than girls. Further, the survey reveals that those districts having the highest social burden face the highest school milk consumption, but only in the free of charge price situation. More results can be expected when individual questionnaire response and demand figures are available and finally analyzed.

More specific findings are expected with the analysis of the pupils' sample which enables a merger between individual demand data with outcomes of individual questionnaires, thus providing quite precise information on de-

mand reactions and attitudes. Subsequently, results should be used to develop an amended school milk program to improve pupils' nutritional situation. But also regional school milk supply and demand across whole Germany should be positively impacted by an enhanced system. Outcomes should also be used for developing the school catering in German schools and to derive recommendations for further school milk policy decisions.

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