



# Study trip with LIFT and Food in Focus

## Beijing

2017-03-25 to 2017-03-31



Cecilia Tullberg  
Gabriel Barbosa  
Graziele Gustinelli Carvalho  
Hanna Harrysson

Huaxing Wu  
Laura Andreea Bolos  
Linnea Qvirist  
Niklas Engström

Gothenburg and Uppsala  
April 2017

## Contents

Day 1: Visit to COFCO research institute – 27/3-2017 .....	3
Day 2: Visit to the Chinese Academy of Agricultural Sciences (CAAS) – 28/3-2017 .....	5
Day 3: Visit to Business Sweden – 2/3-2017 .....	9
Day 4: Visit to the YILI group, 30/3-2017 .....	11

After a long trip with transfer in Frankfurt seven LIFT students and one student from Food in Focus together with Galia Zamaratskaia, study rector for LIFT and coordinator of Food in Focus research school, landed in Beijing the 26<sup>th</sup> of March 6.15 local time. As an early morning snack we all needed to, according to Huaxing Wu, try a very special Chinese delicacy; very very spicy duck stomach. After taking the train to the hotel in central Beijing, we spent the rest day in the Forbidden City while we were struggling against the jetlag. After a nice Chinese dinner we all went to bed to get ready for the following four days of inspiring study trips to food companies, research institute and University in Beijing and Hohhot. During those days we got good insight into both the food industry and the academia in China.

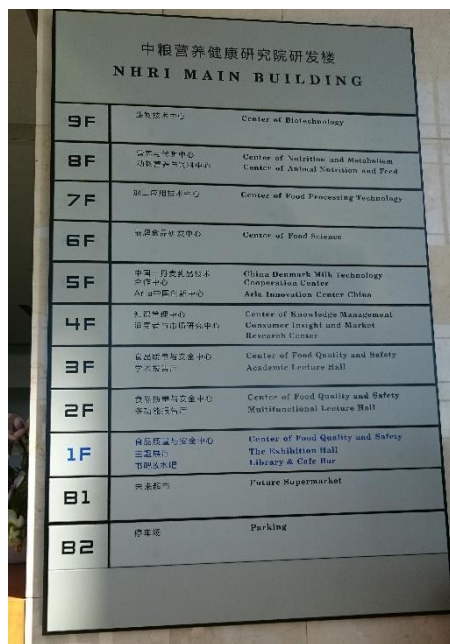
The participants from LIFT were; Cecilia Tullberg, Gabriel Barbosa, Grazielle Gustinelli Carvalho, Hanna Harrysson, Laura Andreea Bolos, Linnea Qvirist and Niklas Engström. The participant from Food in Focus was Huaxing Wu

More specific we visited the **COFCO research institute, the YILI group, Business in Sweden and the Chinese Academy of Agricultural Sciences (CAAS)** both the **Institute of Quality Standards & Testing Technology for Agro-Products (IQSTAP)** and the **Institute of Food Science and Technology (IFST)** during our trip, all of which you can read more about in the report.

## Day 1: Visit to COFCO research institute – 27/3-2017

The first day we visited the state-owned company COFCO. COFCO was founded in 1949, the same year as the Republic of China and is one of China's largest food processor, manufacturer and trader. Their goal is to be a worldwide platform working with both upstream and downstream processes in the food value chain. One of their motto is: from farm to table. 1/10 of all farmers in China is connected to COFCO and it's the largest supplier of agricultural products in China. COFCO has around 140.000 employees and was in 2016 listed as 121<sup>st</sup> in Fortune Global.

The visit started with a brief introduction of the company followed by presentations of Chalmers, SLU, LIFT and Food in Focus. Also all our PhD-projects were briefly presented. Thereafter we got a tour around in their research facilities and we were also shown some of their interesting products (figure 2). All the different research areas gathered under the same roof could be seen in figure 1.



中粮营养健康研究院研发楼 NHRI MAIN BUILDING	
9F	生物技术中心 Center of Biotechnology
8F	营养与代谢中心 Center of Nutrition and Metabolism 动物营养与饲料中心 Center of Animal Nutrition and Feed
7F	食品工程技术中心 Center of Food Processing Technology
6F	食品科学中心 Center of Food Science
5F	中国-丹麦乳品技术 合作中心 China Denmark Milk Technology Cooperation Center 阿拉创新研究中心 Arla Innovation Center China
4F	知识管理 研究中心 Center of Knowledge Management 消费者洞察与市场 研究中心 Consumer Insight and Market Research Center
3F	食品质量与安全中心 学术报告厅 Center of Food Quality and Safety Academic Lecture Hall
2F	食品质量与安全中心 多功能报告厅 Center of Food Quality and Safety Multifunctional Lecture Hall
1F	食品质量与安全中心 展览厅 图书馆及咖啡厅 Center of Food Quality and Safety The Exhibition Hall Library & Cafe Bar
B1	未来超市 Future Supermarket
B2	停车场 Parking

Figure 1; Research areas in the COFCO institute.

During the tour through the research facility we were shown 5 of the centers. At the Center of Biotechnology the main research areas were about: probiotics and prebiotics, protein engineering and food fermentation (they had large 70L food grade fermenters). This center also researched crop and cellulose based ethanol production. At the Center of Nutrition and Metabolism the research was about toxicology and they had close collaboration with hospitals as well as other labs, where they performed animal trials. In this part they also had cell labs working with e.g. Caco-2, HT20 and HEP29, and they had produced a book with nutritional advice and information intended for the public. The research in their Feed lab mainly concerned feed for poultry and beef. To be able to perform their research they have close collaboration with farmers. We were shown the Future Supermarket, connected to the Consumer Insight and Market research center, situated at the ground floor. The aim with the supermarket is to study consumer behaviors. Consumers are asked to shop in the supermarket. All the consumers were equipped with special glasses so the consumer's behavior could be studied. We were also shown their big sensory lab at the Center of Food Quality and Safety. At this center they also analyzed pesticides, micro toxins, as well as residues from packing material, both for their own products and as a third-party laboratory. COFCO also has a collaboration with Arla, and Arla had an innovation center in the building, but we did not have the opportunity to visit this center.





Figure 2; a) LIFT-students outside the reserch center of COFCO; b) The first of nine planned buildings for the expanding reserch center; c) Some innovative products in the COFCO assortment.

The visit was very friendly and they told us that they are open for collaborations in the future.

**Contact information COFCO:**

Msc. NaiBei Zuo  
 COFCO Nutrition and Health Research Institute  
 Future Sciences and Technologies City  
 Beijing China

## Day 2: Visit to the Chinese Academy of Agricultural Sciences (CAAS) – 28/3-2017

At the second day we visited to different institutes at the Chinese Academy of Agricultural Science; Institute of Quality Standards & Testing Technology for Agro-Products (IQSTAP) and Institute of Food Science and Technology (IFST)

### **Institute of Quality Standards & Testing Technology for Agro-Products (IQSTAP)**

Gang Chen at the Institute of Quality Standards & Testing Technology for Agro-Products (IQSTAP) met up and organized an informal presentation of himself and his group (figure 3a-b). Gang is mainly working with food safety with the focus on animals and toxicology, for instance the study of resveratrol and flavonoids (toxicology and benefits), trying to understand the mechanism behind it. The PhD and master students of his group were connected to this area too, but with different focus; e.g. biomarkers, detecting animal products using NMR, milk production and deterioration, veterinary science, aromatic (aryl) hydrocarbons (AHR) and the aryl hydrocarbon receptor. Some of them were also working with cells for *in vitro* toxicology testing. In the future they might use knock out mice with focus on the intestine, since they have permission to use mice in their labs.

They showed us around in their labs (figure 3c-4). At the pesticide lab (in the 5<sup>th</sup> floor) they used LC-MS/MS instruments and supercritical fluid chromatography with CO<sub>2</sub> as the carrier gas. There they e.g. did herb extractions to look for bio-active compounds in Tibetan herbs. They also searched for pesticide replacers looking at extracts from toxic plants, which they call “green pesticides”. At the veterinary drug-toxicology lab they mainly worked with cell cultures (e.g. using Hep cells), ELISAs, rapid analysis of antibiotics and did DNA tracing and looked for gene markers - e.g. for detecting the origin of meat products. They also had a joint Agilent technology collaboration with an instrument hall full of Agilent instruments. In their facilities they additionally had a room for NMR analysis (figure 4c), where detection of metabolites, e.g. in milk was conducted. This to be able to determine the region and animal origin – as an example to distinguish goat from cow milk. They even had a “digesting room”, meaning a lunch room. The visit ended with a nice teppanyaki lunch and a photo of the group outside the building (figure 4b).

### **Contact information; IQSTAP**

Dr. Gang Chen

Institute of Quality Standards & Testing Technology for Agro-Products (IQSTAP)

Chinese Academy of Agricultural Sciences (CAAS)

No.12 Southern Street of Zhong-Guan-Cun. Beijing 100081, China

86-10-82106559 or 86-136 936 388 64

chengang01@caas.cn



Figure 3; a) Gabriel and Huaxing are prepared for the visit! b) The sign at the entrance to the area, CAAS; c) Gang is showing their supercritical fluid equipment.



Figure 4; a) Some intense research going on; b) A lot of equipment; c) NMR instrument.



Figure 5; Photo outside of the IQSTAP building together with Gang and two of his students.



## Institute of Food Science and Technology (IFST)

Xin Li (associate researcher, PhD) at the Institute of Food Science and Technology (IFST) met up and showed us around at the campus of the IFST (figure 6a) and in their different lab facilities (figure 6b). Thereafter there was an organized seminar event where IFST was presented followed by presentations and discussions of the Swedish PhD students' projects (figure 6c and 7). The main presenter from IFST except for Xin Li was Dequan Zhang (Professor, Chief Scientist of Meat Science and Technology Innovation Team, IFST, CAAS).



*Figure 6; a) A walk to the Ministry of Agriculture lab together with Xin Li; b) GC-MS linked with smell detector; c) Presentations.*

Institute of Food Science and Technology (IFST) was founded in 2003 in the Norwest of Beijing affiliated with Chinese Academy of Agriculture Science (CAAS) with focus on Food Science and engineering, nutrition and health, and quality and safety.

The main areas of their research groups are oil and plant protein science, meat quality and science, fruit and vegetable processing and quality control, biological hazards in agro-products processing, Chinese traditional food, food enzyme engineering, cereal processing, potato and sweet potato, post-harvest biology and preservation, mycotoxin prevention and others. It is a very large institute compared to Swedish standards. They have 6 master's programs: Food science, agro-products processing and preservation, bio-chemistry and molecular chemistry, plant pathology, food science and safety, plant protection. They also have 4 doctoral programs: agro-products quality and food safety, agro-products processing and utilization, bio-chemistry and molecular biology, plant pathology. And they have 4 post-doctoral research stations as well.

The IFST/CAAS has established collaboration with 18 countries, for example with Argentina and work with FAO and agro-product processing (Italy). We understood that they are interested in collaboration with Sweden for students to visit our labs and facilities, as we did there, and also for international supervision which is needed for their students, for example joint PhD student program of 3 years – one supervisor from China, one from the Netherlands, where the student spend e.g. one year in Beijing, and two years in Wageningen.

At the tour around their facilities, we got the opportunity to see their pre-treatment rooms, and an open platform for analysis instruments. Here they had interesting equipment, such as an electronic nose (figure 9), tongue and eye, and several different texture analysis instruments. They also showed us around in their pilot hall, where they did processing of various types of foods. Examples were spray drying for milk powder, meat storage for different thawing conditions, processing of animal by-products (bones and blood), and cooking equipment such as fish shaped food for baking (figure 7c).



They also had an extruder for e.g. snack production (figure 7c). The visit ended with a common group picture at the entrance hall at IFST (figure 8).

**Contact information IFST:**

Dr. Xin Li

Institute of Food Science and Technology (IFST)

Chinese Academy of Agricultural Sciences (CAAS)

No.1 Nongda South Rd., Xi Beiwang, Haidan District, Beijing 100193, China

86-10-62819392 or 86-158 011 283 65

xinli.caas@gmail.com



*Figure 7; a) Galia and Dequan Zhang after the presentations; b) Fish shaped baking tins; c) Extruder in the pilot hall.*



*Figure 8; Group picture after the visit at IFST.*

### Day 3: Visit to Business Sweden – 2/3-2017

Business Sweden's purpose is to help Swedish companies reach their full international potential and foreign companies to invest and expand in Sweden. They offer to their customers' strategic advice and hands-on support.

Business Sweden is owned by the Swedish Government and the industry, a partnership that provides access to contacts and networks at all levels. Business Sweden was founded on the first of January, 2013, by a merger of the Swedish Trade Council (Exportrådet) and Invest Sweden.<sup>1</sup>

Big green oaks standing proudly on the side of a small country-side road and red wooden houses (figure 8b-c) is not the first picture you have in mind while being in one of the biggest cities in the world. This is one of the many pictures of Swedish landscapes we encounter when we enter the office space of Business Sweden in Beijing. After receiving Swedish coffee and a short informal conversation we start the "formal" visit. Everyone in our group presents themselves and then Henrik talks about Business Sweden.

Business Sweden has 4 offices (figure 8a) distributed in Beijing, Shanghai, Taiwan and Hong Kong and together they work in more than 500 projects every year. The office we visited is in Peking, placed in a business building and composed by 2 conference rooms and 1 incubator, where several people belonging to 10 different Swedish companies work in landscape office. Their work is very relevant considering that China is today the world's largest economy, and hence, the most important consumer market in the world.

Their focus is to work with well-established Swedish products, such as technologies, paper, food, health care, business platform, etc. People from younger generations in China, especially young mothers, are becoming more aware about food quality and they don't trust Chinese food. Therefore Swedish food is being valued in China and good examples are the baby food from Semper and the müsli from ICA.

The contact person in the company was Henrik. He studied economics in Stockholm. After university, he started working and then, he got the opportunity to come to China. He works together with 2 other Swedes, all project managers. Henrik is starting his own company now, and he aims to introduce skincare cosmetics for men, since there are too few options in the market. In parts, the lack of options is because new cosmetics need to go through a long process, including animal tests. Since the process is so long, difficult, and expensive only few cosmetics brands are in China. Moreover, the Chinese people want to have new options, but at the same time they are sceptical to new brands and before buying a new product, they want references that "approve" this new product; for instance, advertisements with famous people or video tutorials talking about the product. Part of this distrust in new product is a consequence of having too many fake things mixed up and since the most buy online, it can be difficult to distinguish and/or trust.

---

<sup>1</sup> <http://www.business-sweden.se/en/about-us/About-Business-Sweden/>

Henrik works more intensively with health care, transport and energy. Swedish Business is also working a lot to attract Chinese tourists to Sweden, and so far, they have good results. They aim to bring Chinese companies to Sweden as well, as an example, Alibaba, which supplies Chinese products in order to achieve the aim of bringing Swedish companies to China, Business Sweden works in 4 steps:

1. Evaluate the opportunities
2. Choose strategy
3. Establish presence
4. Grow business

The Swedish companies normally try to establish themselves in China without asking for consultancy, but due to the peculiarities of the country, it can be very difficult and they need help. Most of companies that look for help from Business Sweden have already tried to get into the Chinese market without success.

**Contact Business in Sweden:**

Henrik Bigelius Consultant

Beijing, Greater China

Business Sweden

Room 609, 6/F CYTS Plaza, No. 5 Dongzhimen Nandajie,

Dongcheng District, Beijing 100007, P.R. China

M +86 139 1154 3630

T +86 10 5815 6006, ext. 826 F +86 10 5815 6223

[www.business-sweden.se](http://www.business-sweden.se)



Figure 8; a) Andreea and Graziele outside the office in Beijing; b) Business in Swedens office with pictures of the Swedish landscape; c) The consultant Henrik Bigelius

## Day 4: Visit to the YILI group, 30/3-2017

The last day we visited YILI group (figure 10-11), through Dr. Huang, who is the vice manager responsible for the risk assessment in the Yili Innovation Center. The company is mainly located in Hohhot city in Inner Mongolia. We arrived at lunch time, and were offered lunch by the company. After the lunch, the manager of the Yili innovation center Dr. Yun, together with another two vice managers who are responsible for production line and science research, respectively, joined our meeting. Galia introduced us as a group and the research in SLU (figure 9), while Cecilia introduced the researches in Chalmers and then we made a quick round of presentations.



Figure 9; Galia presented our group and some of the research activities in Food in Focus and LiFT.

We were then shown a presentation movie about the YILI group, unfortunately in Chinese, but with translation by Dr. Huang.

Facts in the movie:

- There is a high level of product testing (1 prod per batch)
- They have four big sectors: liquid milk, yogurt, milk powder and ice-cream.
- Chinese consumption of milk/dairy is 1 liter per person and year
- The YILI group is number 1 in Asia and to 8 of Chinese dairy companies on a global level
- The turnover in 2015 was 60 billion RNB
- The main believe in the YILI group is Quality
- They built milk powder factory mainly in China, but also in New Zealand.
- They also have one producing line for organic milk, however the market is still small in China

The YILI group was founded in 1956 by a group of Muslim farmer. In 1983, the milk production sector and milk processing sector were split into two companies. In 1993, the processing company turned to a corporation company and named Yili. In the same year, they started to produce ice-cream. In 1996, they were public listing on the Chinese A-share market. Their cooperation with Swedish company Tetra Pak was initiated in 1997, the Tetra Pak production line greatly supported the sale of the company in most part of China with long shelf life liquid milk. The success marketing of liquid milk supported Yili became top 1 milk company in China since 1999.

After the change from the 1-child policy in China, to a 2-child policy, the market and sales for infant formulas has increased. Approximately one out of six children drink YILI milk.



The milk consumption has increased probably also related to increased overall living standards for the Chinese population. Also, milk used to be intended for children, sick people or old people, but is nowadays more considered as a product for all people. The growth rate of liquid milk were more than 10% during the last few years, but start to drop to below 10% in last year, however the yoghurt and ice-cream is still growth for more than 10%. A lactose free product is selling well, but not as good as expected, and there is room for market improvement. For now, it is marketed as “easier to digest”, which is a quite general expression. It is not marketed as possible to digest for persons with lactose intolerance for example.

The YILI group was one of the sponsors of the Olympic Games in 2008, and of the EXPO in Shanghai in 2010.

YILI group also owns some cow farms, and house 15000 cows who produce about 10% of their raw milk. The rest comes from contract farms of varying sizes.

The YILI group has collaborations with Ivy League universities, the Lincoln University in New Zealand and with Wageningen University in the Netherlands.

To increase consumers trust in the company, transparency is important. The YILI group has for example opened up their farms for visitors to show the consumers that it is safe and trustworthy. Further, they expressed the need to be open to media if something goes wrong, as it is better than risking a small bad rumor to increase and harm the business.



*Figure 10; We made a walk through the huge company areas.*

The YILI group is able to control its process from farm to consumer. For example, they have a GPS on their milk lorry's from the farm to the plant, and whenever a lorry stops for more than 5 minutes, the GPS will alarm and the driver need to specify why he has stopped. They have also introduced a trace system on the actual package of the produce, which the consumer can scan with their smartphone to retrieve information about where it has been produced and how it has travelled.

After the presentation of the YILI group we were given a guided tour in their milk pilot plant by Dr Yun. We were shown facilities for production and handling, producing and storage testing raw milk, ice

cream, chocolate and cheese. They were working with new product development and find solutions for the production line. The cheese production has however been down for some time due to that the old legislations around the cheese production was too hard to make it working. However, the Chinese government has updated the regulations (becoming more in line with EU legislations) and the YILI group may soon take up the development of cheese products again.

After the pilot plant tour, we were given a guided tour in the YILI group dairy history museum which is located beside their innovation center, and at the end we were also given some drinkable yoghurt with fruit and oats inside.

The visit was very friendly, well organized and welcoming. The company sent a car to pick us up at the airport, and also drove us in to the city of Hohhot afterwards.



*Figure 11; The main building of the YILI area.*

**Contact information YILI group:**

Dr. Huang  
No. 8, Jinshan Road  
Jinshan Development Zone  
Hohhot, 010110