

# **WORKING GROUP SENEGAL**

## **Poultry Meat Processing, Distribution and Waste Management**



# TABLE OF CONTENTS

<b>INTRODUCTION</b>	<b>2</b>
<b>WORKING GROUP FRAMEWORK</b>	<b>3</b>
<b>THEMATIC SUBGROUP SESSIONS</b>	<b>5</b>
<b>CONCLUSION AND NEXT STEPS</b>	<b>6</b>
<b>ANNEXES</b>	<b>7</b>

**DOCUMENT PREPARED FOR:** Embassy of the Kingdom of the Netherlands in Dakar

**DOCUMENT PREPARED BY:** Africa Insights Desk,  
The Netherlands-African Business Council

**DOCUMENT PURPOSE:**

At the request of the Embassy of the Kingdom of the Netherlands in Dakar - Agricultural Network, NABC coordinated a workshop on the Senegalese poultry sector with Senegalese and Dutch participants. Subsequently, NABC developed this report that summarizes it. The workshop was specifically aimed at finding opportunities for and interface between Senegalese and Dutch companies in the poultry sector.



# INTRODUCTION

Poultry production in Senegal has been growing in leaps and bounds. There is still a world to be won in terms of efficiency. The Agricultural Counsellor for Morocco and Senegal, on behalf of the Embassy of the Kingdom of the Netherlands in Dakar, has requested the Netherlands-African Business Council (NABC) to set up a Working Group consisting of both Senegalese and Dutch companies in the poultry sector. The main objective was to identify concrete and priority actions for business cooperation that can lead to a better functioning of the poultry value chain in Senegal, while contributing to the improvement of the following sub-themes: processing industry, slaughtering and waste management, as well as product conservation and cold chain. After the first Working Group meeting, the Senegalese companies expressed their interest regarding an extra meeting about further processing of eggs. Based on this request of the Senegalese companies, egg processing was included as an additional theme to the Working Group. This report is a summary of the outcomes of the Working Group sessions.



# WORKING GROUP FRAMEWORK

Aiming to have an efficient outcome of this Working Group, it was decided that each week, a sub-theme out of the four would be discussed. NABC had a role of organising and coordinating these meetings, promoting them on social networks, identifying common grounds on which Senegalese and Dutch companies could work together and presenting the results to the participants and the Agricultural Council.

## THE FIRST MEETING TOOK PLACE ON THE 2ND OF DECEMBER 2021 WITH THE FOLLOWING KEY PARTICIPANTS:

### COMMISSIONER AND RVO:

- Niek Schelling (Agricultural Counsellor, Agricultural Council)
- Hanneke van Hoof (Advisor Private Sector Development, Netherlands Enterprise Agency, RVO)
- Viviane Faye (Agricultural Advisor, Agricultural Council)

### MINISTRY OF LIVESTOCK AND SENEGALESE COMPANIES:

- Mamadou Ba (Secretary General of Interprofession (IPAS) / Veterinary Consultant at Sedima)
- Serge Sadio (President of the Federation of the Poultry Industry of Senegal (FAFA))
- Makhtar Diouf (Director of the Centre d'impulsion pour la modernisation de l'élevage (Cimel))
- Solange Baguidi (Direction of Animal Industries (DIA))
- Moussa Diouf (Aviprest Slaughterhouse manager)

### DUTCH COMPANIES:

- Eric Mooiweer (iGrowChicken)
- Marco de Bruijn (Marel)
- Tim Verbruggen (MS Schippers)

### NABC:

- Jan Hulzebosch (NABC)
- Núria Vlonk-Cunha Soares (NABC)
- Virginie Peccoud (NABC)

The purpose of this meeting was for acquaintance between the participants, and to organise the coming weeks.

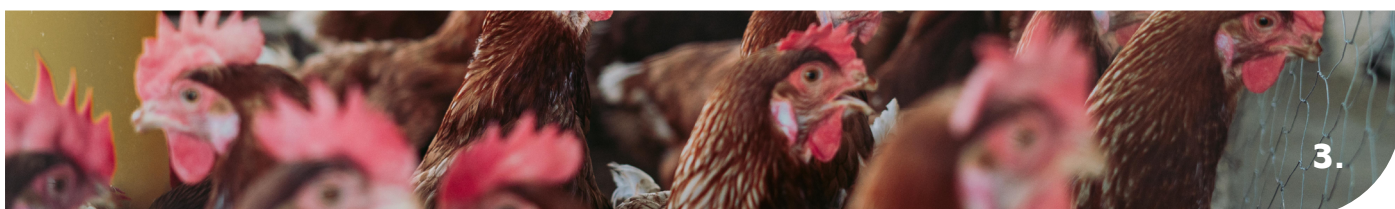




Table 1: Schedule of the Senegal Poultry Working Group, from December 9th 2021 until February 10th 2022.

<b>SCHEDULE OF MEETINGS</b> All meetings started at 14.00 PM (CET), 13.00 PM (GMT)	
DATE	TOPIC
<b>09 DEC 2021</b>	Setting up subgroup: poultry meat processing and further processing
<b>14 DEC 2021</b>	Subgroup meeting: poultry meat processing and further processing
<b>16 DEC 2021</b>	Presentation subgroup: poultry meat processing and further processing (by Marco de Bruin)
	Setting up subgroup on: product conservation, cold chain, and logistics
<b>21 DEC 2021</b>	Subgroup meeting: product conservation, cold chain and logistics
<b>20 JAN 2022</b>	Presentation subgroup on: product conservation cold chain, and logistics (by Rens Elfrink)
	Setting up subgroup on: waste management
<b>25 JAN 2022</b>	Subgroup meeting: waste management
<b>03 FEB 2022</b>	Presentation subgroup on Waste management (by Helmus Damen)
	Setting up a subgroup on (further) processing of eggs
<b>08 FEB 2022</b>	Subgroup meeting (further) egg processing
<b>10 FEB 2022</b>	Presentation Subgroup on (further) processing of eggs (by Wijnand van den Berg)
	Overview presentation by Jan Hulzebosch
	RVO instruments presentation by Hanneke van Hoof
	Discussion on advice, follow ups and next steps

On Thursday December 9th, the meat processing subgroup was set up. The Senegalese stakeholders voiced their challenges in the value chain in the first place. Subsequently, the Dutch stakeholders presented their suggestions and solutions. This way one was able to get the most input from both sides while allowing them to be equally involved in the working group. At the end, a subgroup of meat processing (1st theme), composed of Dutch and Senegalese stakeholders was formed. The formed sub-group then held their meeting the following Tuesday the 14th of December to further discuss the problems and possible solutions, in order to make them more concrete and come up with the final outcomes. Finally, to conclude the theme, the concerned Dutch company (Marel in the case of meat processing) prepared a presentation with the outcomes of the subgroup (status quo with challenges, and potential solutions to be offered) for Thursday the 16th of December. After the Dutch company's presentation on Thursday, the challenges and solutions for the next theme (cold chain and logistics) were addressed, and at the end a subgroup was formed (like the previous week). And the next themes followed the same order of one theme per week.



THEMATIC SUBGROUP SESSIONS

Table 2: Different subgroups, content discussed, and their outcome.

THEME/SUBGROUP	PARTICIPANTS	STATUS QUO	PROBLEMS	SOLUTIONS	OUTCOME
1. MEAT AND FURTHER PROCESSING	Viviane Faye (Agricultural Council) Solange Bamba (DIA) Mamadou Ba (Sedima) Makhtar Diouf (CIMEL) Serge Sadio (FAFA) Moussa Ndiaye Diouf (Aviprest) Eric Mooiweer (iGrowChicken) Marco de Bruijn (Marel) Tim Verbruggen (MS Schippers) Jan Hulzebosch (NABC) Virginie Peccoud (NABC) Núria Vlonk-Cunha Soares (NABC)	Four years ago, Senegal only had 2 official slaughterhouses. Today, there are 5 official modern slaughterhouses and 1 which is being built. These are located around Dakar and Thiès and represent around 20% of the national production. On the other hand, there are many traditional informal slaughterhouses. Approximately 80% of the chicken is slaughtered at these ‘small’ slaughterhouses (around 40 million chickens).	Lack of: ■ A sound application of the national sanitary norms, especially in traditional slaughterhouses. ■ Equipment in traditional slaughterhouses: chickens are defeathered by hand. ■ No machinery for mechanically separating meat. ■ Training: the need is expressed by government officials as well as slaughterhouse owners: demand for capacity building for the workers.	■ Owners of small slaughterhouses can be grouped in cooperatives with small improvements in terms of sanitation. ■ Public private partnership with Dutch companies bringing expertise, machinery and material to develop the value chain.	■ Improvements can be made in small slaughterhouses by introducing basic machines that would transform slaughtering into a semi-automatic operation. This would lead to more safe and hygienic operations. ■ Different small abattoirs can come together and do their operations in a slightly larger unit, where each room is specialised in a certain step of slaughtering.
2. PRODUCTION, CONSERVATION, COLD CHAIN AND LOGISTICS	Viviane Faye (Agricultural Council) Solange Bamba (DIA) Mamadou Ba (Sedima) Makhtar Diouf (CIMEL) Serge Sadio (FAFA) Moussa Ndiaye Diouf (Aviprest) Eric Mooiweer (iGrowChicken) Marco de Bruijn (Marel) Rens Elferink (Celtic Cooling) Raphael Hofmann (Celtic Coolin) Tim Verbruggen (MS Schippers) Jan Hulzebosch (NABC) Virginie Peccoud (NABC) Núria Vlonk-Cunha Soares (NABC)	■ There are no integrated cold chambers in the trucks. ■ The cold chain is not present. Only the army, the port, or large industries have access to it and everything is private (via diesel generators). ■ Electricity in Senegal is experienced as being very expensive. High temperatures are the rule rather than the exception and planning is therefore key: there is a need to secure the cold chain during the transportation phase to guarantee quality. ■ During the first quarter of the year the demand for chicken is lower in comparison to the rest of year, leading to an overproduction of chicken. Conservation facilities cannot handle this surplus. It is important to have chicken in cold storage rooms: in January, February and March.	■ Keeping the activities near each other solves many challenges by reducing risks of transport and electricity costs. Otherwise cooling boxes can be used. ■ There are possibilities to add solar solutions, but that solar off grid would not be possible for big plants due to the large amount of power needed. Only for smaller ones. ■ Instead of doubling the cold storage capacity one could raise the height of a facility: this way the installation capacity can be tripled. The investment remains limited. This is the cheapest way to invest in cold storage when there is uncertainty regarding the capacity needed.	■ Since electricity in Dakar is unstable and expensive, solar panels could be used for cooling storage rooms. Batteries might be needed too in case there is no sun. This could be expensive, a business case is needed to estimate the return on investment. ■ For small abattoirs, transport can be done in cooling boxes that are put in vans that have a low temperature. They can be wired to the car as a source of energy. For larger abattoirs, larger vehicles can be used.	
3. WASTE MANAGEMENT	Viviane Faye (Agricultural Council) Solange Bamba (DIA) Mamadou Ba (Sedima) Makhtar Diouf (CIMEL) Serge Sadio (FAFA) Moussa Ndiaye Diouf (Aviprest) Eric Mooiweer (iGrowChicken) Marco de Bruijn (Marel) Lambert Rute (Marel) Eric Nab (Marel) Rens Elferink (Celtic Cooling) Raphael Hofmann (Celtic Coolin) Tim Verbruggen (MS Schippers) Cent van Vliet (MOBA Egg Processing Machines) Joris Oijen (MOBA Egg Processing Machines) Coumba Kebe (Senegalese Veterinary Public Health Division) Lisa Korteweg (Trinomics) Koen Rademaekers (Trinomics) Stef Roijmans (Schippers) Helmus Damen (Mavitec) Jan Hulzebosch (NABC) Ralph Rustom (NABC) Núria Vlonk-Cunha Soares (NABC)	■ Animal by-products after slaughtering are left on the ground in Senegal, and this creates many sanitary problems. ■ Chicken manure that is falling on the floor is not cleaned up. ■ In total, 50 million chickens are slaughtered per year in Senegal. Only 10 out of the 50 million go through big slaughterhouses, while the rest (40) go through the smaller ones.	■ A challenge in all slaughterhouses (except one of the bigger ones) and especially the small ones is the management of waste like feathers and intestines. ■ An additional problem for small slaughterhouses is that they cannot collect the waste next to the habitations ■ Giving protein meals to animals in Senegal is banned because of phytosanitary problems and cross contamination risks.	■ A solution is to turn the waste into protein meal, which is a highly digestible material that is very demanded in the global market. ■ Since protein from waste is banned in Senegal, it could still be sold to other countries for a really good price. Blood and manure are also highly desired. ■ Chicken manure should be dried and sterilised to kill harmful pathogens and antibiotics. It should be initially separated from animal by-products, to then be used as a fertiliser after sterilisation.	■ Bundling small abattoirs together would be an efficient way in order to collect the waste. This way it would be feasible commercially wise, like in Noblesse Wijster in the Netherlands where 7 small abattoirs collect their waste together. ■ A cooling system will be needed to store their waste material. ■ With this subgroup, we came to the conclusion that a visit to Senegal is needed in order to have more insight on what is happening there on the ground. Only a slight insight can be given in virtual meetings. ■ For larger abattoirs, further processing is needed, where the intestines, blood and feathers and other by-products of processed chicken that goes to waste, is recycled into a new product (high in proteins) that can be sold and that provides revenue. This will also create jobs.
4. FURTHER PROCESSING OF EGGS	Viviane Faye (Agricultural Council) Solange Bamba (DIA) Mamadou Ba (Sedima) Serge Sadio (FAFA) Eric Mooiweer (iGrowChicken) Eric Nab (Marel) Joris Oijen (MOBA Egg Processing Machines) Coumba Kebe (Senegalese Veterinary Public Health Division) Helmus Damen (Mavitec) Sergio Bataillard (Sanovo) Wijnand van den Berg (Sanovo) Jan Hulzebosch (NABC) Ralph Rustom (NABC) Femke Konatey-Dekker (NABC)	■ Processed eggs are imported into Senegal. The demand is high. ■ During certain times of the year, there is a surplus of local table eggs resulting in a very low price for the eggs.	■ The demand is not always stable, but rather volatile. ■ The industries that are in baking, and producing mayonnaise need eggs and they sometimes have difficulties finding any.	■ When there is a surplus of shell eggs, it can be stored at 3-4 degrees for a maximum of 5-6 months. Then they can be pasteurised (cold storage costs are to consider). ■ However, a minimum number of 300 000 eggs per day are needed to run a processing unit, and preferably throughout the whole year. ■ It is very labour intensive and costly to stop the processing unit for a long period e.g. 6 months, since a lot of maintenance and cleaning would be needed for the whole machine. So it may not be efficient.	■ Given the 300 000 eggs per day minimum target and the difficulty to stop the machine for a certain period, it is not yet clear whether an egg processing plant in Senegal is viable, a feasibility study could answer this question.



# CONCLUSION AND NEXT STEPS

At the end of the working group's last meeting on the 10th of February, potential next steps were discussed between both the Senegalese and Dutch members. The following potential next steps were suggested first:

- Trade mission / study tour to Senegal. The solutions proposed by the Dutch companies need to fit the Senegalese reality. It is therefore key to first have a clear idea of the context. A mission to Senegal would certainly help understanding the challenges faced in the Senegalese poultry sector.
- Trade mission / study tour from Senegal to the Netherlands in order for the Senegalese companies to see how the poultry sector is structured in the Netherlands. This could lead to a better understanding of what is possible in the future and if some of the processes in the Netherlands can be replicated in Senegal.
- Business case: the Senegalese side brought forward the urgency to implement a project in the area of poultry meat processing. For instance, to equip small slaughterhouses with basic slaughtering machines that would transform slaughtering into a semi-automatic operation. Simultaneously, setting up a small scale cooperative processing plant including cold chain fits well in this context.
- Feasibility study for rendering plant waste materials.
- Feasibility study for setting up an egg processing plant.

Then everyone voiced his opinion on the priority of the next steps. All participants agreed that the first priority should be a trade mission from the Netherlands to Senegal in order to meet everyone, see the actual situation on the ground, and assess the possible opportunities. This way risks will be limited. The importance of setting up a business case of a small scale cooperative processing plant with a cold chain was also emphasised. As well as doing feasibility studies before setting up the units.

Mr. Sadio finally mentioned that the local poultry sector is evolving very rapidly, adding that if something efficient needs to be done as a follow up of this working group, it should be done as soon as possible. Consequently, NABC suggests organising a trade mission to Senegal in the 2nd or 3rd quarter of 2022.



# **ANNEXES: MINUTES OF THE WORKING GROUP MEETINGS**



## MINUTES: 1ST SESSION

<b>WG NAME</b>	Working group poultry meat processing, distribution and waste management Senegal
<b>CHAIRPERSONS</b>	Mr. Jan Hulzebosch and Mrs. Núria Vlonk-Cunha Soares
<b>MINUTES SECRETARY</b>	Ms. Virginie Peccoud
<b>PRESENT</b>	Niek Schelling (Agricultural Council), Viviane Faye (Agricultural Council), Solange Bamba (DIA), Mamadou Ba (Sedima), Makhtar Diouf (CIMEL), Serge Sadio (FAFA), Moussa Ndiaye Diouf (Aviprest), Hanneke van Hoof (RVO), Eric Mooiweer iGrowChicken), Marco de Bruijn (Marel), Tim Verbruggen (MS Schippers), Jan Hulzebosch (NABC), Virginie Peccoud (NABC), Núria Vlonk-Cunha Soares (NABC)
<b>DATE</b>	02/12/2021

### 1. BACKGROUND INFORMATION

The objective of these meetings is to identify concrete and priority actions to contribute to the improvement of the processing industry and slaughtering, as well as product conservation and cold chain through business cooperation between Dutch and Senegalese supply chain key actors. The goal of this working group is to see how Dutch companies can work together with Senegalese companies and contribute with their expertise. Production in Senegal has been increasing rapidly but there is a need for more efficiency which would increase productivity.

Three case studies on poultry processing:

1. Further processing of poultry meat
2. Product conservation in the cold chain
3. Waste management of poultry processing plants: less waste and water purification plants

NABC's role is to organise and coordinate these meetings, promote them on social networks, and present the results to the Agricultural Council, which commissioned this set-up.

The deliverables are:

- Organisation and facilitation of six (6) working groups and their minutes
- Identification of common grounds on which Senegalese and Dutch companies can work together
- Final report covering quick scans and potential business cases on the 3 subthemes
- Publicity after each meeting via NABC's social media
- Presentation of the outcomes to participants and commissioner

### 2. INTRODUCTION OF EVERYONE

Not everyone knows each other. So everyone introduced themselves.

The working group aims to stay flexible, everyone can come with suggestions/critics.

### 3. NEXT MEETINGS

Even though the initial plan was to organise 6 meetings in 2021, it was agreed to have 3 meetings this year (2, 9, 16 December) and 3 more next year (13, 20, 27 January). All meetings will take place on Thursdays at 2pm.

#### **4. CASE STUDIES**

Case studies are the basis of the upcoming meetings. Each week a sub-theme will be discussed (meat processing, cold chain and waste management). Participants can form a subgroup to discuss the sub-themes. The next meeting (9 Dec.) will be on processing and slaughtering: understanding what is needed and how we can achieve this. A week later (16 Dec.) the case study will be presented to the group. We could ask other NABC members who are specialized in the field of poultry waste to have more expertise: ex: Mavitec Groupe. Then with regards to the cold chain discussion, another NABC member in the field of infrastructure would be better. From the Senegalese side, the group includes highly qualified people but not for waste management discussion. A suggestion is to add an environmentalist: another meeting will be organized between the group of Senegal.

Participants from the Dutch and Senegalese side have to decide before the next meeting whether they add participants or not to the group. Then they can determine other partners who could add value: Wednesday Núria will make the point together with Jan and Viviane.

Egg processing is an important topic: waste related to egg processing units.

#### **5. EXTRA INFORMATION**

RVO commissioned a study on the valorisation of waste streams on the opportunities for companies to work together: focusing on the waste sector in Senegal. A suggestion would be to work on combining the subgroup 'waste management' and the RVO study.

#### **6. ANY OTHER BUSINESS**

Send an agenda before each meeting and send minutes after each meeting.

It is expected that everyone attends the meetings.



## MINUTES: 2ND SESSION

<b>WG NAME</b>	Working group poultry meat processing, distribution and waste management Senegal
<b>CHAIRPERSONS</b>	Mr. Jan Hulzebosch and Mrs. Núria Vlonk-Cunha Soares
<b>MINUTES SECRETARY</b>	Ms. Virginie Peccoud
<b>PRESENT</b>	Viviane Faye (Agricultural Council), Solange Bamba (DIA), Mamadou Ba (Sedima), Makhtar Diouf (CIMEL), Serge Sadio (FAFA), Moussa Ndiaye Diouf (Aviprest), Eric Mooiweer iGrowChicken), Marco de Bruijn (Marel), Tim Verbruggen (MS Schippers), Jan Hulzebosch (NABC), Virginie Peccoud (NABC), Núria Vlonk-Cunha Soares (NABC)
<b>DATE</b>	09/12/2021

### 1. FEEDBACK ON THE WORKING GROUP

The Senegalese parties will be involved in all the subgroups because they think that it is all relevant for them. They are suggesting focusing more on egg processing either as a point of discussion and to add a Dutch company specialised in egg processing for their inputs.

### 2. TODAY'S WORKING GROUP

Today we will discuss meat processing. First the Senegalese stakeholders will voice their issues and the challenges that they are facing in the value chain. Then, the Dutch stakeholders will try to understand the situation and come up with suggestions and solutions. After this workgroup session, the sub-group focusing on meat processing will then prepare a case study presentation for the next meeting.

### 3. THE CURRENT STATE OF THE POULTRY VALUE CHAIN IN SENEGAL

Four years ago, the country only had 2 official slaughter houses. Today, there are 5 modern official slaughter houses and 1 which is being built. These houses are located around Dakar and Thiès and they only represent around 20% of the national production. Besides, there are many traditional informal slaughter houses, approximately 80% of the national meat production is killed here (approximately forty million chickens). There is an important demand from the population for quality poultry products and in order to develop the value chain the Senegalese stakeholders want to have a two-fold approach.

- To support, modernise and expand the official slaughter houses
- To improve the condition of informal slaughter houses

The poultry industry has the attention of the Senegalese government. A credit line was set-up to facilitate the development within the sector.

### 4. CHALLENGES FACED BY SENEGAL IN MEAT PROCESSING:

- Lack of sanitary norms: Especially in traditional slaughterhouses there is a lack of hygiene. Lack of waste management and water management expertise and norms.
- Lack of equipment: In traditional slaughter houses, chickens are defeathered by hand. No machinery for mechanically separating meat. This goes for cold chain equipment which hinders the meat conservation process.
- Lack of meat processing technique: There is an important local demand for charcuterie (ie: sausages, ham). However, the Senegalese do not have the capacity to answer to that demand so most of it is imported from Morocco.

- Lack of training: The need is expressed by government officials as well as for slaughter houses owners: demand for capacity building.
- Lack of transport planning: Transport dead chicken to processing units

## **5. POTENTIAL SOLUTIONS**

Owners of small slaughterhouses can be grouped in cooperatives. Public private partnership with Dutch companies bringing expertise and material to develop the value chain.

## **6. NEXT SESSIONS**

The sub-group focusing on meat processing will consist of:

- Mme Solange Bamba
- Mr Moussa Diouf
- Mr Serge Sadio
- Mr Makhtar Diouf
- Mr Mamadou Ba
- Mr Eric Mooiweer
- Mr Tim Verbruggen
- Mr Marco de Bruijn

The sub-group meeting will be held online on Tuesday 14th of December from 2pm to 3.30pm (13h00-14h30 Dakar time). The objective is to work out a case study and present it during the 3rd meeting of the working group, which will take place on the 16th of December from 2pm to 3.30pm (13h00-14h30 Dakar time).



## MINUTES: 3RD SESSION

<b>WG NAME</b>	Working group poultry meat processing, distribution and waste management Senegal
<b>CHAIRPERSONS</b>	Mr. Jan Hulzebosch and Mrs. Núria Vlonk-Cunha Soares
<b>MINUTES SECRETARY</b>	Ms. Virginie Peccoud
<b>PRESENT</b>	Viviane Faye (Agricultural Council), Solange Bamba (DIA), Mamadou Ba (Sedima), Makhtar Diouf (CIMEL), Serge Sadio (FAFA), Moussa Ndiaye Diouf (Aviprest), Eric Mooiweer iGrowChicken), Marco de Bruijn (Marel), Rens Elferink (Celtic Cooling), Raphaël Hofmann (Celtic Cooling), Tim Verbruggen (MS Schippers), Jan Hulzebosch (NABC), Virginie Peccoud (NABC), Núria Vlonk-Cunha Soares (NABC)
<b>DATE</b>	16/12/2021

### 1. INTRODUCTION

1. Opening of the meeting, present new members of the group Rens Elferink and Raphaël Hofmann of Celtic Cooling.
2. Presentation of Marco de Bruijn of the findings of the sub-group in meat processing.
3. Discuss about the challenges and potential solutions in cooling and conservation, formulate the mission and choose the participants of the sub group.

### 2. PRESENTATION BY MARCO DE BRUIJN

The goal is to have better end products and also more added value to the products. To improve the conditions there are different solutions; namely right operating procedure and planning, trained people. The planning phase is crucial because everything is connected and it is important to make sure that the supply fits the demand when trading fresh products.

Slaughter plan can be done in two different phases:

- Primary: from the living animal until the dead chicken. For this phase it is important to focus on hygiene, higher production efficiency and also improved food safety.
- Secondary: packing, creating jobs, transforming into other products. For this phase it is important to find ways to add more value to the product. A lot are now imported from Morocco but the local added value could be done in Senegal. It requires a lot of people so it can create jobs.

There are some small plants, medium plants and the industrial plants: the priority is to improve the small ones and then go into industrial processing upscaling. Small plants could work together in cooperatives so effective planning can be done.

Cooperatives in the Senegalese poultry sector are almost non-existent. People are used to working individually so it will be hard to group them. How can they then be organised? There are some stakeholders who have a large network in the field of poultry so they can organise some cooperatives ex: CEDIMA, AVISEN: they have the potential to create a slaughterhouse and they put in place the whole distribution system. Summarized, it is a challenge but not impossible. Communication is key!

Industrial processing plants have a higher capacity: cost effective with water and waste management on the side. An important point is to look at the value chain optimisation.

A solution would be to put the value chain closer together and reduce risks of live bird processing. However, this is impossible because of phytosanitary constraints and in Senegal it is not possible to have proximity between the slaughterhouse and the hatchery.

Next steps for further investigation:

**Step 1:** Support and training small scale processing (better end products)

**Step 1:** Support and training small scale further processing (More value to product and create jobs)

**Step 2:** Business case Cooperative (small processing plant/integration?)

**Step 2:** Business case Further processing MDM: mechanically deboned meat: what are the possibilities?

Niek and Vivianne will see what are the follow ups of these points.

Marco will send the presentation and a small summary text to Jan after this meeting.

### 3. COLD CHAMBER AND LOGISTICS CHALLENGES

The Senegalese counterparts will present the constraints in the value chain and then the Dutch members will come up with solutions.

Real problem of transport: they do not have integrated the cold chambers in the trucks. The cold chain is not working: no structure to conserve. Indeed, only the army, the port or large industries have access to it and everything is private. Moreover, electricity is very expensive. Senegal is a warm country and we have to plan everything: there is a need to secure the cold chain during the transportation phase to guarantee quality.

### 4. COLD CHAMBER AND LOGISTICS SOLUTIONS

To reach efficient production conservation we need to start with a good slaughter process and with good sanitary conditions. It is important to adopt a holistic approach since there is no constant flux. There is also a need for a structural production plan not to depend on production which leads to overproduction or underproduction.

To reduce the challenges there is a simple solution: keep the activities near to each other. It reduces risks of transport and electricity costs.

There are possibilities to add solar solutions but it should be understood that solar off grid would not be possible for big plants due to the large amount of power needed. Perhaps for the smaller ones? We could investigate the capacity of solar and what is the ROI.

The demand is mainly for frozen chicken and not really for fresh chicken. The need for cold chain is for the whole value chain regarding transport however, for the on site cold chain it is mainly for small plants.

An issue is that chickens are not owned by the person who kills the chicken but it belongs to the producer. Hence there is an important question of what is the incentive to invest? Is there a conflict of interest? Here the Senegalese group need to see if their priority is productivity or employment.

Preservation and need for infrastructure is a priority to be able to work the chicken in the most hygienic way and to organize the transport. Another issue is that during a certain period there is an overproduction of chicken and no conservation facilities. It is important to have chicken cold rooms: in January, February and March.

According to Celtic Cooling storage facilities have to be calculated based on the capacity: instead of doubling the capacity we could upfront take into consideration to maybe raise the height of the facility: they could triple the installation capacity: the investment would not be too much. This is the cheapest way to invest in cold storage when there is uncertainty around the capacity needed.



However, it was underlined by iGrowChicken that it all starts with the planning. If this step is skipped people need unlimited capacity hence, managing it better would be cheaper and more efficient.

## **5. SUB GROUP FORMATION AND NEXT MEETINGS**

Regarding the subgroup cold chain/logistics, it will be composed by:

- Mme Solange Bamba
- Mr Moussa Diouf
- Mr Serge Sadio
- Mr Makhtar Diouf
- Mr Mamadou Ba
- Mr Eric Mooiweer
- Mr Rens Elferink
- Mr Raphael Hofmann

Rens will send an invitation to the members of the subgroup. Their meeting will take place Tuesday 21 December 2021 at 13.00 CET/12.00 Senegal time.

The next meeting of the Working Group will take place on 13 January 2022 at 14.00 CET/13.00 Senegal time.

## MINUTES: 4TH SESSION

<b>WG NAME</b>	Working group poultry meat processing, distribution and waste management Senegal
<b>CHAIRPERSONS</b>	Mr. Jan Hulzebosch and Mrs. Núria Vlonk-Cunha Soares
<b>MINUTES SECRETARY</b>	Mr. Ralph Rustom
<b>PRESENT</b>	Viviane Faye (Agricultural Council), Solange Bamba (DIA), Mamadou Ba (Sedima), Makhtar Diouf (CIMEL), Serge Sadio (FAFA), Moussa Ndiaye Diouf (Aviprest), Eric Mooiweer (iGrowChicken), Marco de Bruijn (Marel), Lambert Rute (Marel), Eric Nab (Marel), Rens Elferink (Celtic Cooling), Raphaël Hofmann (Celtic Cooling), Tim Verbruggen (MS Schippers), Cent van Vliet, Joris Oijen (MOBA Egg Processing Machines), Coumba Kebe (Head of the Veterinary Public Health Division), Lisa Korteweg and Koen Rademaekers (Trinomics), Stef Roijmans (Schippers), Helmus Damen (Mavitec), Jan Hulzebosch (NABC), Núria Vlonk-Cunha Soares (NABC), Ralph Rustom (NABC)
<b>DATE</b>	20/01/2022

### 1. INTRODUCTION

1. Opening of the meeting, presentation of new members: Cent van Vliet, Joris Oijen, Coumba Kebe, Lisa Korteweg and Koen Rademaekers, Stef Roijmans, Helmus Damen and Ralph Rustom;
2. Presentation of the Subgroup on "product conservation, cold chain, and logistics" by Rens Elferink;
3. Discussion about the challenges and potential solutions in waste management and water treatment. Then set up Subgroup on "waste management and water treatment", and select the sub group members;
4. Closing.

### 2. PRESENTATION BY RENS ELFERINK

The goal is to have better end products, product value and employment opportunities.

The controlled cold chain:

The needs that came out of the session:

500-5000 birds per hour

Facility can be expanded within the same building

Strong need for electrical support: solar techno is an option

Transport solutions are also needed

Solutions:

Marel poultry processing line in Celtic cold room.

Focus on product quality and food safety:

Cross contamination should be a very big point and concern in the slaughterhouse. UV from bioclimatic is used for that.

Solar technology: designed by solar techno, with batteries maintenance is needed

A project concept: 500 birds per week, expendable in future from 500 to 1250, without breaking down the rooms. 70% frozen 30% fresh 2 weeks frozen , 3 weeks fresh. If there would be a distribution problem, then it is considered an overflow from a fresh storage to the freezing storage. Price is excluding solar system and transport and building structure.

Transport: pre-fabricated, all in a box, can be produced locally. It could warm and heat itself, works also with different voltages. Good price wise.

Questions about presentation:

- a. A remark was mentioned about correcting the location of the small Senegalese slaughterhouses on the map that is in the presentation. The small slaughterhouses were all over Senegal, while in reality 80% of them are located in Dakar and Thiès.
- b. A question was raised about the need of more than 2 weeks of storage, minimum 1 month is needed. Yes, there are possibilities for more than 1 month of storage. In addition to Marel's 6m height recommendation, it is suggested that the height is of 6-8m usually. That way the storage can be easily upgraded while costing much less than expanding the whole storage (only 6-8% more than the original price). Also in some cases, new wall panels are needed so in general that is feasible, but Celtic would like to discuss that with the specific customer and assess the situation in order to find a tailor made solution.
- c. There was a question raised about storing solar energy through the solar technology with the batteries for a long period of time. Since storing this energy is a problem there. This question could not be answered due to being short on time.

Rens will put all the information together and share it on we transfer. He will send it to Jan.

### **3. WASTE MANAGEMENT AND WATER TREATMENT CHALLENGES**

In total, 50 million chickens are slaughtered per year in Senegal. Only 10 out of the 50 million go through big slaughterhouses, while the rest (40) go through the smaller ones.

A challenge in all slaughterhouses (except one of the bigger ones) and specially the small ones is the management of waste like feathers and intestines. These cannot be discharged randomly, or the slaughterhouse would be sanctioned. The management of waste water is also not optimal.

The only exception is one of the big slaughterhouses that manage the waste. It has water treatment facility (where water is treated then used in irrigation nearby). In addition it transforms the intestines and the feathers into protein meal (which is not used in Senegal).

An additional problem for small slaughterhouses is that they cannot collect the waste next to the habitations (it was mentioned that this will be discussed in detail in the subgroup).

A question about using this waste in the aquaculture sector was brought up. It turned out that it could be used, but an industry would be needed for the treatment of the product with specific sterilisation techniques.

### **4. WASTE MANAGEMENT AND WATER TREATMENT SOLUTIONS**

The solution for waste coming from feathers and intestines is straightforward. It is to turn the waste into protein meal, which is a highly digestible material that is very demanded in the global market. Giving protein meals to animals in Senegal is banned because of phytosanitary problems of cross contamination, but it could still be given to other countries for a really good price. Blood and manure are also highly desired. Mamadou was advised to take contact with Helmus to further discuss this.



## **5. SUB GROUP FORMATIONS AND NEXT MEETINGS**

Regarding the subgroup Waste management and water treatment, it will be composed by:

- Mrs Viviane Faye
- Mrs Solange Bamba
- Mrs Coumba Kebe
- Mr Helmus Damen
- Mr Eric Nab
- Mr Moussa Ndiaye Diouf
- Mr Serge Sadio
- Mr Makhtar Diouf
- Mr Mamadou Ba

Lisa Korteweg will discuss whether they will join or not with Koen her colleague from Trinomics, then will inform Jan.

The Subgroup meeting will take place on Tuesday the 25th of January at 13:00 Dakar time / 14:00 CET.

## **6. CLOSING**

Regarding Marel, Lambert Rute will take Marco's position in Africa. From next time he will replace him.

The Sub group Meeting will happen on Tuesday the 25th of January at 13:00 Dakar time / 14:00 CET. The next Working Group Meeting will take place on Thursday 27th of January at 13:00 Dakar time / 14:00 CE.

## MINUTES: 5TH SESSION

<b>WG NAME</b>	Working group poultry meat processing, distribution and waste management Senegal
<b>CHAIRPERSONS</b>	Mr. Jan Hulzebosch and Mrs. Núria Vlonk-Cunha Soares
<b>MINUTES SECRETARY</b>	Mr. Ralph Rustom
<b>PRESENT</b>	Viviane Faye (Agricultural Council), Solange Bamba (DIA), Mamadou Ba (Sedima), Serge Sadio (FAFA), Eric Mooiweer (iGrowChicken), Eric Nab (Marel), Joris Oijen (MOBA Egg Processing Machines), Coumba Kebe (Head of the Veterinary Public Health Division), Helmus Damen (Mavitec), Sergio Bataillard (Sanovo), Jan Hulzebosch (NABC), Núria Vlonk-Cunha Soares (NABC), Ralph Rustom (NABC)
<b>DATE</b>	03/02/2022

### 1. INTRODUCTION

Opening of the meeting, presentation of new member: Sergio Bataillard from Sanovo; Presentation of the Subgroup on "waste management and waste water management" by Helmus Damen; Discussion about the challenges and potential solutions in "further processing of eggs". Then set up Subgroup on "further processing of eggs", and select the sub group members; Closing.

### 2. PRESENTATION BY HELMUS DAMEN

(More details in the presentation)

What has been identified in Dakar is the following: a lot of raw materials and dead animals are left on the farm. It is all left on the ground, no one wants that, since it's a hazard. Hatchery by-products that are not treated are a hazard on the farm as well.

The small abattoirs in Senegal are difficult to manage, bundling them together would be an efficient way in order to sell the recycled proteins afterwards. Collecting the waste together could be feasible commercially, it could be done like in Noblesse Wijster in the Netherlands (7 abattoirs group their waste together).

Chicken manure that is falling on the floor is not cleaned up. It should be dried and sterilized to kill harmful pathogens and antibiotics. Chicken manure should be separated from animal by-products and could be sterilized at a 100 degrees for 20 minutes, to then be used as a fertilizer. The feathers are now being composted, so you're transforming raw materials into fertilizers with high ammonia levels. Feathers need a lot of time to be composted.

With the meetings the working group had, Helmus said now he has a slight insight about the situation in Senegal, but to be able to find the solutions efficiently and on site, a trip to Senegal needs to be organized.

The presentation will be sent in French as well.

Comments about the presentation:

- It was mentioned that it would be interesting to have an entity that organizes the collection and takes it to a central place. Could be financed by the government. In the Netherlands, the government is sponsoring them to have land and civil works.
- What is done in the Netherlands (Noblesse Wijster) could be replicated in Senegal, but nice transport tools are needed. Specific containers need to be placed in front of the small abattoirs, from which the waste will be collected and sent to the recycling site. The logistics of this were discussed before in the sub group but very quickly.
- A good conclusion about this subgroup could be a visit to Senegal in order to look at the situation there and do a proposal for the possible solutions. Mavitec can find the equipment to implement the solutions, but the logistics need to be organized.

### 3. FURTHER PROCESSING OF EGGS: CHALLENGES AND SOLUTIONS

The presentation of Sergio Bataillard (Sanovo): to be sent later.

Concerning Africa: in North Africa, there are several liquid egg factories. For sub-Saharan Africa it is an area to develop, it started in Nigeria, and in South Africa and it has developed a little.

Benefits from pasteurizing eggs, it's a product that kills salmonella and other hazards, it's a product which is appreciated by the industry since the shells could be carrying harmful bacteria into the factories. There are international industries now who prefer to get powder eggs in order to benefit from that.

Pasteurized liquid eggs must be preserved between 3-4 degrees, transportation must be done in cold trucks, and storage must be cold too.

It is not possible to have an egg powder factory with few eggs, at least 60,000 eggs per hour, otherwise it is not very profitable. To start the industry: 100,000 or 600,000 eggs per day

Comments on the presentation:

- The presentation is very interesting, industries in Senegal import products to make mayonnaise, there is a strong demand. We hear that there are problems with hygiene standards. So what Sergio is proposing suits Senegal.
- The qualities and the amounts that Sergio mentions are important, but when there is no demand, we put the eggs in the ground, the demand is not always stable, but rather volatile. Turning the eggs into powder will be fine, but as price and quantity it depends, sometimes a lot of eggs, sometimes not. Proposition by Sergio: shell eggs can be stored at 3-4 degrees for a maximum of 5-6 months, to then pasteurize them (to consider the costs of cold storage).
- A policy is currently under discussion in Senegal to stimulate egg production. We must study this project and take our time, even if we start with the minimum quantities, we should start. If we could do a comparative study, we could move towards producing egg powder consistently. At least everything that could have been lost can be transformed to ensure production, with time this can be done. The production of powdered eggs in Senegal has to be really executed (inputs can also come from the surrounding regions, but everything has to be done step by step).
- The problem with eggs is that there are no processing units. And the industries that are in baking, and producing mayonnaise need eggs and they can't find any. In Senegal, it is not allowed to import eggs for consumption, these industries have difficulty in finding products. The other problem is that there are times when there is a surplus of production, and a lot is lost, there are not enough units to process the eggs. It is therefore urgent to put units to transform the eggs.
- The Tunisian company Poulina mayonnaise has installed a factory for pasteurized liquid egg and has dried them to export them to Senegal. Then they failed because there is no market for the egg white. All of this is to emphasize that there is a market for pasteurized liquid eggs in Senegal.



#### **4. SUB GROUP FORMATIONS AND NEXT MEETINGS**

Regarding the subgroup of further processing of eggs, it will be composed by:

- Mr Sergio Bataillard
- Mrs Solange Bamba
- Mrs Coumba Kebe
- Mr Serge Sadio
- Mr Mamadou Ba
- Mr Moussa Diouf
- Mr Makhtar Diouf

The purpose of the sub group will not necessarily be to see if it is financially possible, but technically, to come up with a couple of proposals on Tuesday. Maybe two proposals: one with a medium and one with a smaller scale, but it is up to them in the subgroup.

The Subgroup meeting will take place on Tuesday the 8th of February at 13:00 Dakar time / 14:00 CET. Sergio will invite the Senegalese participants, Jan will send him the email addresses.

#### **5. CLOSING**

The Sub group Meeting will happen on Tuesday the 8th of February at 13:00 Dakar time / 14:00 CET. The next Working Group Meeting will take place on Thursday 10th of February at 13:00 Dakar time / 14:00 CET.

## MINUTES: 6TH SESSION

<b>WG NAME</b>	Working group poultry meat processing, distribution and waste management Senegal
<b>CHAIRPERSONS</b>	Mr. Jan Hulzebosch and Mrs. Núria Vlonk-Cunha Soares
<b>MINUTES SECRETARY</b>	Mr. Ralph Rustom
<b>PRESENT</b>	Viviane Faye (Agricultural Council), Solange Bamba (DIA), Mamadou Ba (Sedima), Serge Sadio (FAFA), Eric Mooiweer (iGrowChicken), Eric Nab (Marel), Joris Oijen (MOBA Egg Processing Machines), Coumba Kebe (Head of the Veterinary Public Health Division), Helmus Damen (Mavitec), Niek Schelling (Agricultural Council in Rabat), Lambert Rutten (Marel), Wijnand van den Berg (Sanovo), Cent van Vliet (hundred per cent), Rens Elferink (Celtic Cooling), Rokhaya (Giga Initiatives), Hanneke van Hoof (RVO), Stef Roijmans (Schipppers), Jan Hulzebosch (NABC), Femke Dekker (NABC), Ralph Rustom (NABC)
<b>DATE</b>	10/02/2022

### 1. INTRODUCTION

1. Opening of the meeting
2. Presentation of the egg processing subgroup by Wijnand van den Berg from Sanovo.
3. Overview of project ideas by Jan
4. Presentation of the RVO instruments by Hanneke
5. Discussion and advice on follow-up
6. Final remarks by Niek Schelling

### 2. PRESENTATION ON EGG PROCESSING BY WIJNAND VAN DEN BERG FROM SANOVO

(More details in the presentation)

The first step in egg processing is breaking the egg, then it is stored at a low temperature. Pasteurization is done to reduce the bacteria count, not to sterilize and eliminate all bacteria.

Chronological steps for egg processing: breaking, pasteurization, filtration, drying.

Eggshell processing: can be used at the end as fertilizer or as animal feed.

After breaking, we filter our products, keep them in a closed circle so that oxygen does not enter the filtered parts.

Filling is done in a bagging box or container filling,

Powdering eggs is very energy consuming, it is a commodity, but gives a long shelf life.

Questions:

- **Would egg processing into liquid control the surplus of eggs that happens in certain periods of the year in Senegal?**

If the liquid eggs option is chosen, then the shelf life in the cold room would be up to a maximum of 2 weeks. If powdered egg is chosen, shelf life would go up to 1 year.

■ **Any idea about the energy costs that were discussed on Tuesday?**

Wijnand asked his colleagues, but they said that they cannot give him an exact number or even an estimation, since there are many variables that determine energy costs for an egg processing unit. A feasibility study with more market info will be needed in order to assess the situation more and be able to give more insight.

■ **How much does 1L of processed liquid eggs cost in euros?**

The purchase price is 85 cents/kg. Table eggs are quantified in numbers not weight.

■ **How many eggs are needed to produce 1L of liquid egg?**

18 eggs/L

### 3. OVERVIEW OF PROJECT IDEAS BY JAN HULZEBOSCH

#### Subgroup meat processing:

Improvement is needed in the smaller abattoirs where there are no sanitary measures taken, and there is a risk for food safety there, as well as poor quality of poultry meat. These small abattoirs constitute 80% of the poultry market in Senegal. Small improvements can be done by introducing basic machines that would transform slaughtering into a semi-automatic operation to make the operation a little bit more hygienic and safe. Different small abattoirs can come together and do their operations in a slightly larger unit, where each room is specialized in a certain step of slaughtering. Ventilation is key in such cases, airflow should be in 1 direction, such as dirty air moves in the way. On the other hand, for larger abattoirs, further processing is needed, where the intestines, blood and feathers and other by-products of processed chicken that goes to waste, is recycled into a new product that can be sold and that provides revenue. This will also create jobs.

Next steps for further investigations in this subgroup are the following:

For small abattoirs:

**Step 1:** Support and training for small scale processing (better end products)

**Step 2:** Business case Cooperative (Small processing plants)

For bigger ones:

**Step 1:** Support and training further processing (More value to product & create jobs)

**Step 2:** Business case Further processing, and MDM (mechanically deboned meat)

#### Subgroup logistics, cold chain and transport:

Because electricity in Dakar is unstable and expensive, solar panels should be used for cooling storage rooms. Batteries might be needed too in case there is no sun. This could be expensive, a business case is needed to estimate the return on investment. For small abattoirs, transport can be done in boxes that are put in vans that can have a low temperature, they can be wired to the lighter of the car as a source of energy (it gets its energy from the vehicle itself). Motorcycles are an option also but for shorter distances. For larger abattoirs, larger vehicles can be used.

#### Subgroup Waste management

Animal by-products after slaughtering are left on the ground in Senegal, and this creates many problems. Since 80% of abattoirs in Senegal are small, it would be an option to see if these can be clustered in order to make it feasible to transform "waste" to end product for animal feed and oils. A cooling system will be required for the smaller operations, where smaller abattoirs can bundle the raw materials, in order to make it feasible to render. With this subgroup, we came to the conclusion that a visit to Senegal is needed in order to have more insight on what is happening there. Only a slight insight can be given in such meetings.

#### Subgroup processing of eggs:

Processed eggs are imported in Senegal, there is a demand for them. In certain times of the year, there is a surplus of table eggs, so the prices become very low. So egg processing should be considered there. However, a minimum number of 300 000 eggs per day are needed to run a processing unit, and preferably throughout the whole year. It is very labour intensive and costly to stop the processing unit for a long period e.g. 6 months, since a lot of maintenance and cleaning would be needed for the whole machine. It is not clear whether an egg processing plant in Senegal is viable, a feasibility study could answer this question.

Possible next steps: (to be discussed later under point 5):

- Trade mission / study tour to Senegal
- Trade mission / study tour from Senegal to Netherlands
- Business case: setting up a small scale cooperative processing plant including a cold chain
- Feasibility study for rendering plant waste materials
- Feasibility study for setting up egg processing plant

#### **4. PRESENTATION OF RVO INSTRUMENTS BY HANNEKE**

(All details are in the presentation that was shared)

##### **DGGF (Dutch Good Growth Fund):**

Mainly for supporting investment and export of Dutch companies abroad. Examples given for growing potatoes and onions in Senegal.

##### **DHI**

Mainly for demonstrations, feasibility studies, and investment support. Would be most interesting in the case of this working group, to do a pilot plant or a feasibility study. Feasibility study: Aims to demonstrate the technical and financial feasibility of Dutch products/services to potential foreign customers. Investment Preparation Studies: enable investment or financing decision and project. Demo projects aim to prove that technology, capital goods or services work, are effective and cost-effective in the local context for local target groups on the smallest possible scale.

##### **Impact Clusters**

For longer periods of at least 3 years. A minimum of 4 parties should be included, with a consultant like NABC that coordinates. It is a grant for private sector development activities, with an aim to develop the sector, improve local entrepreneurship, and Increase of trade and investments in developing countries by Dutch and local private sector.

The difference between DHI and Impact Cluster is that DHI is more focused on export, while DHI focuses more on the development of the local value chain.

#### **5. DISCUSSION AND ADVICE ON FOLLOW UP**

Everyone agrees that the next step needed is a trade mission from the Netherlands to Senegal in order to meet everyone, see the actual detailed situation there on the ground and assess the possible opportunities. This way risks will be limited.

The importance of setting up a business case of a small scale cooperative processing plant with a cold chain was also emphasized. As well as doing feasibility studies before setting up units, to reduce the risks. We need to continue what we started.

A comment was made mentioning that the poultry sector in Senegal is evolving very quickly, and if something needs to be done, it needs to be done now as quickly as possible.



Another comment was about the importance of data at farm level, which was not discussed during this working group. Adding that such data is important to improve the supply chain.

#### **6. CLOSING REMARKS BY NIEK SCHELLING**

Niek thanks everyone for their contribution, and is looking forward to strengthening these collaborations after the working groups with concrete steps.



**AFRICA INSIGHTS DESK**  
[WWW.NABC.NL](http://WWW.NABC.NL)