



# Evaluation of User Satisfaction with Respiratory Protective Masks in Poultry and Pig Farming



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Research engineer specialised in  
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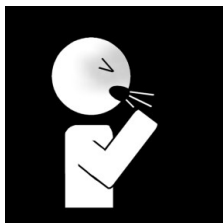
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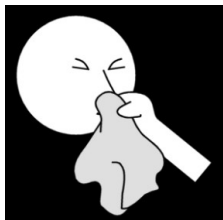


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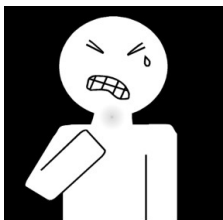
## Dust

- Penetration in the pulmonary alveoli ( $<4\text{ }\mu\text{m}$ )
- Carrier of pathogens



## Ammonia

- Respiratory tract irritation
- Water-soluble > mucous membranes (nose, eyes, throat)



## Inorganic vapors

- Skin irritation
- Intoxication

Can cause respiratory diseases



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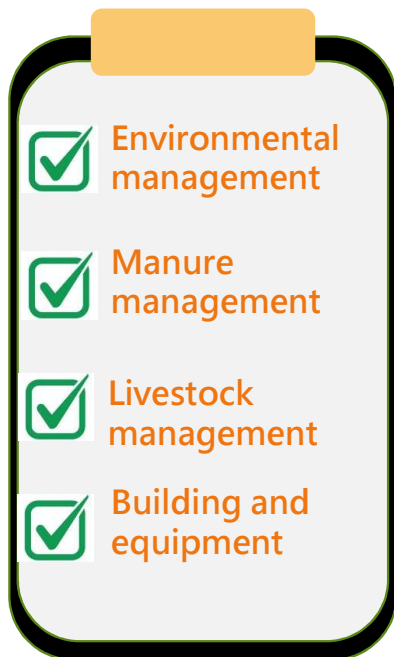
## Objective

To identify respiratory protective masks that farmers are willing to wear in real working conditions.

# The QualiAir Project



## Respiratory risk self-assessment



## Risk level assessment

### Risk level



## Recommended preventive measures



**PREVENTION :**  
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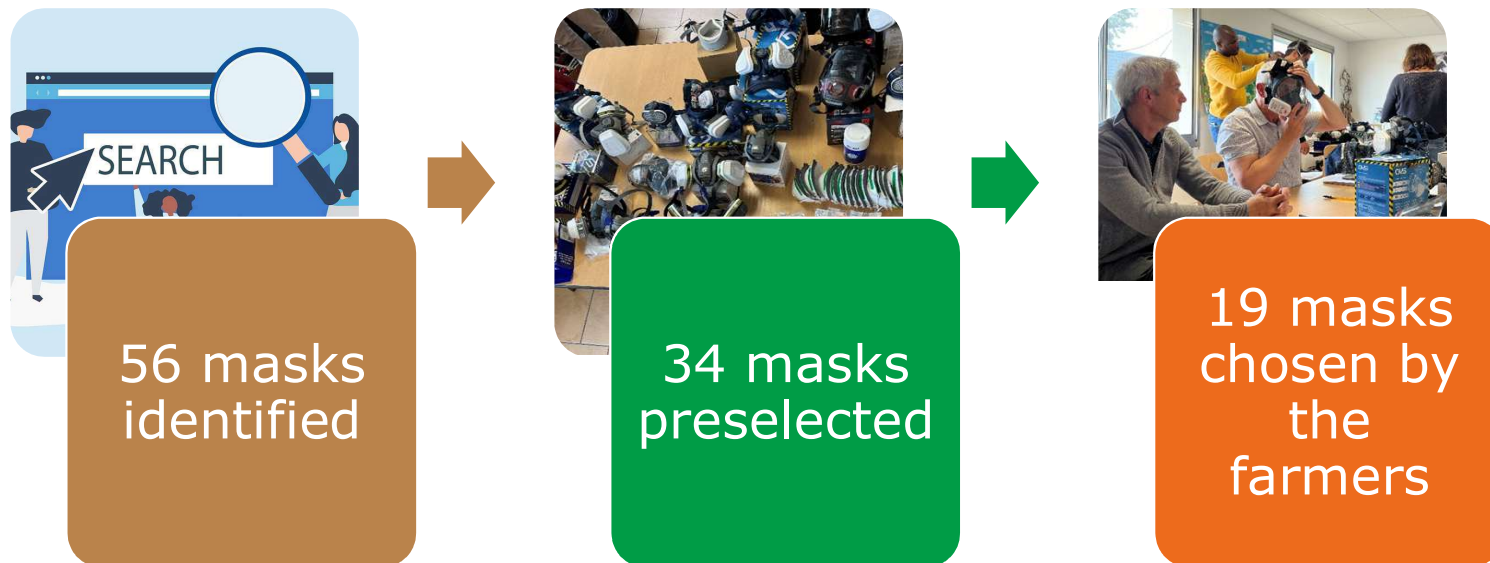


**PROTECTION**

**The tool was designed with 24 pig and poultry farmers involved in the project from beginning to end.**

# Study design

## Respiratory masks selection



## Masks evaluation in real farm conditions



# Evaluation and statistical analysis

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## Evaluation form

Description of tests conditions:  
Mask tested, tasks performed,  
duration of the tasks, time of the  
tests

Ratings :

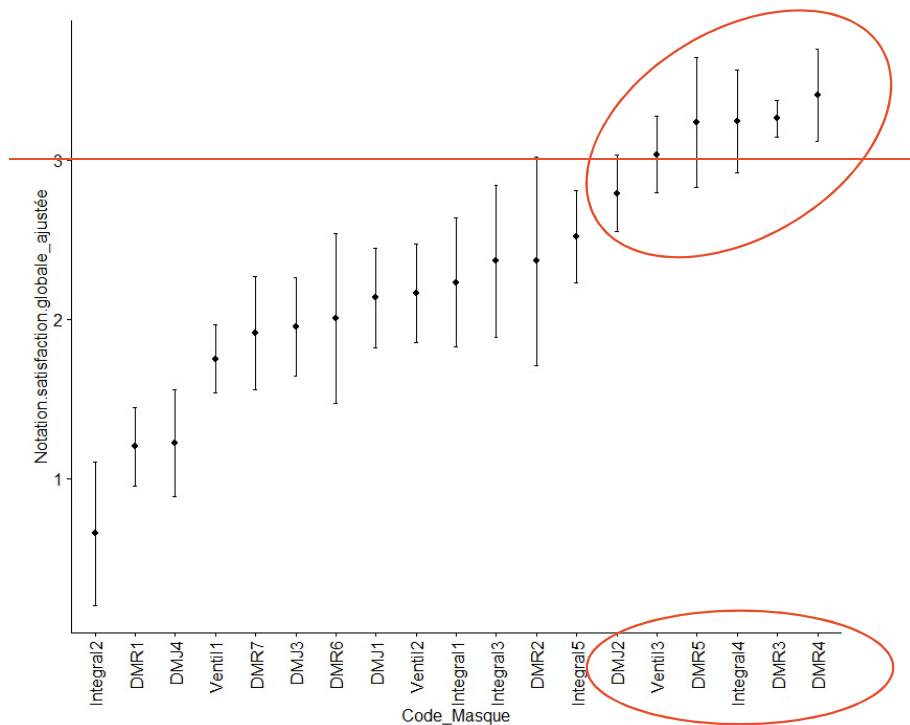
- Overall satisfaction
- 14 criterias (comfort, efficiency, ease to use, compatibility with other equipments,...)

Comments :

- Pros and cons
- Features they would retain to design the ideal mask

- ❖ Qualitativ analysis of all the evaluation forms collected from the 58 testers
- ❖ Not every participant tested every mask  
=> Only 31 testers out of 58 were included in the statistical analyses
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# Overall satisfaction



Notation :  
 0 – Not satisfied  
 1- Slightly satisfied  
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## Top performers

- 3 reusable half masks : DMR3, DMR4, DMR5
- 1 full-face mask : Integral4
- 1 powered respirator : Ventil3
- 1 disposable mask : DMJ2

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# Why were these masks preferred ?

| Mask        | Easy to put on | Ability to fit face shape | Good field of vision | Easy to breathe | Easy to communicate | No itchings | Lightness  | Easy to put remove | No marks on the face |
|-------------|----------------|---------------------------|----------------------|-----------------|---------------------|-------------|------------|--------------------|----------------------|
| DMJ2        | 3,6±0,7        | 3,7±1,0**                 | 3,8±1,0*             | 3,0±0,7         | 2,9±0,2             | 2,9±0,7     | 4,2±0,3*** | 3,9±0,4***         | 3,0±0,6**            |
| DMR3        | 3,2±0,6        | 3,1±0,4                   | 3,4±0,8              | 3,2±0,8         | 2,0±0,7**           | 3,0±0,6     | 3,2±0,6    | 3,2±0,5            | 1,5±1,0              |
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| DMR5        | 3,6±0,5**      | 4,3±0,7**                 | 4,2±0,3**            | 3,7±0 ;0        | 2,6±0,4             | 3,6±0,2     | 4,0±0,7*   | 3,7±0,3            | 2,6±1,1              |
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| Global mean | 3,08           | 2,87                      | 2,99                 | 3,14            | 2,49                | 2,82        | 2,97       | 3,17               | 2,04                 |

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## Common weaknesses :

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# Conclusions

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## Take-home messages

- ✓ Comfort is essential for acceptance.
  - ✓ The ideal mask doesn't exist.
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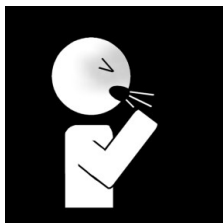


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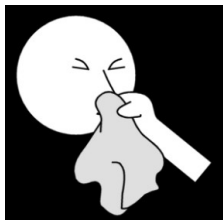


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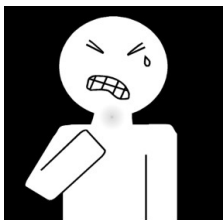
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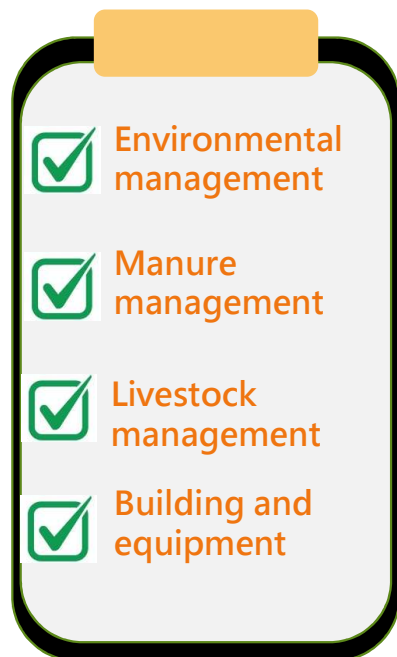
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### Risk level



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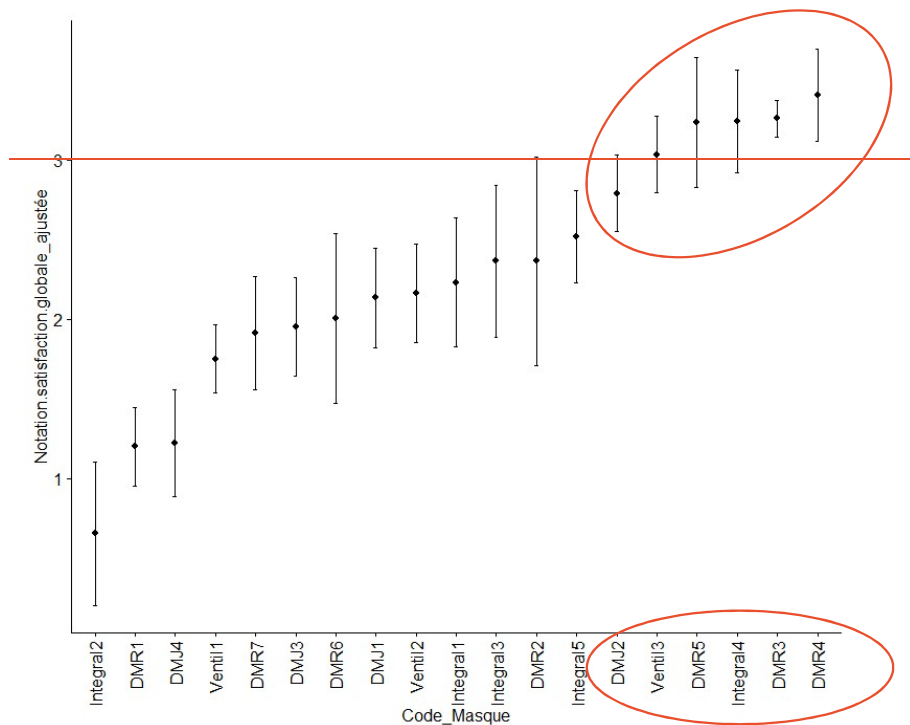
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## **Take-home messages**

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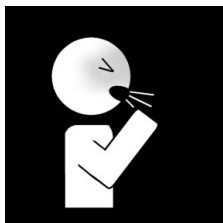
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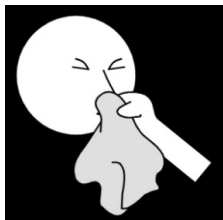


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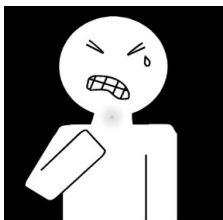
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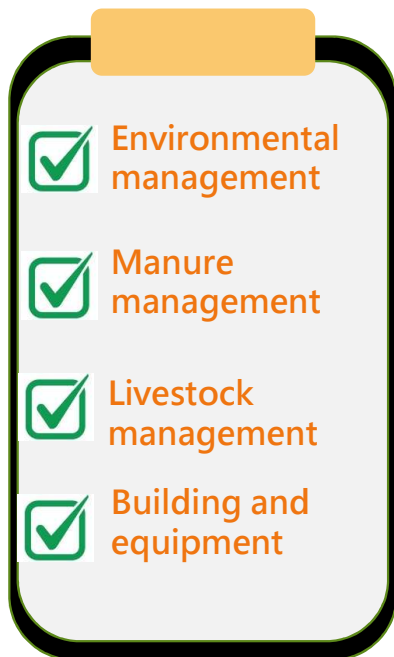
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# The QualiAir Project



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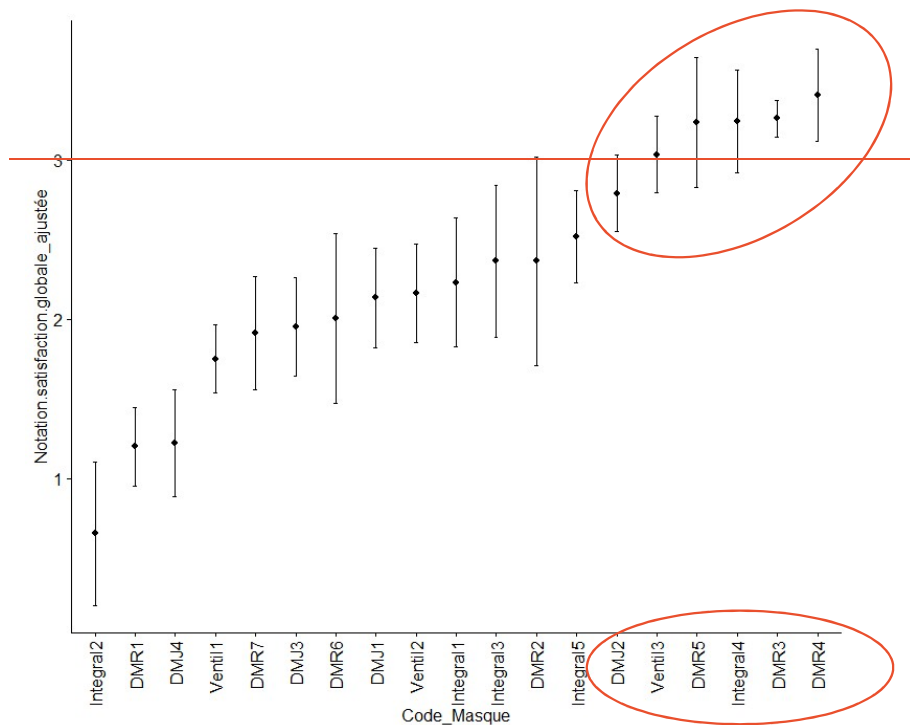
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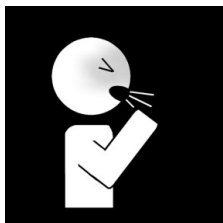


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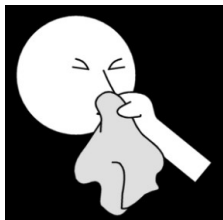


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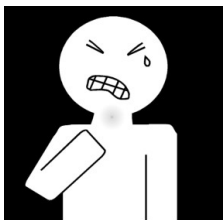
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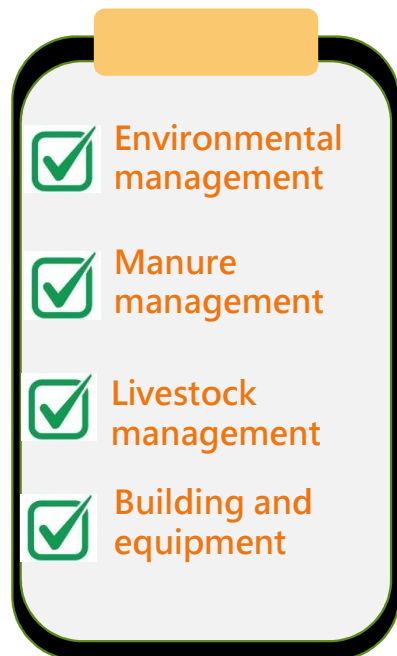
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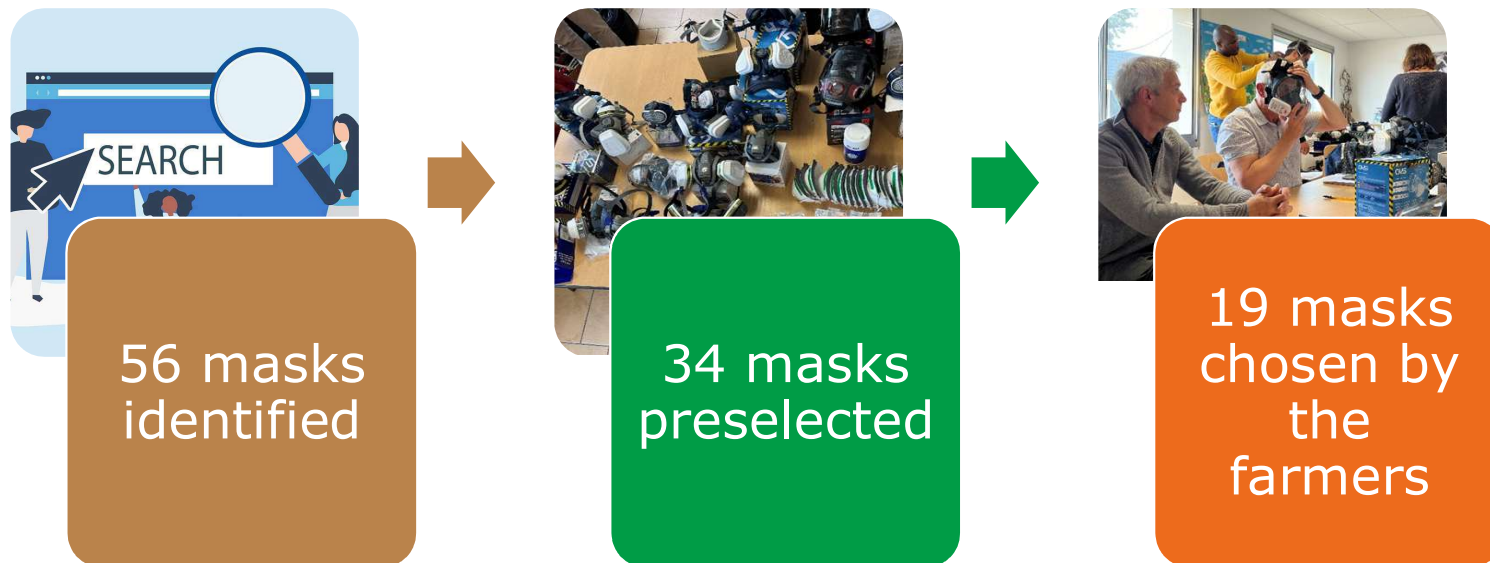


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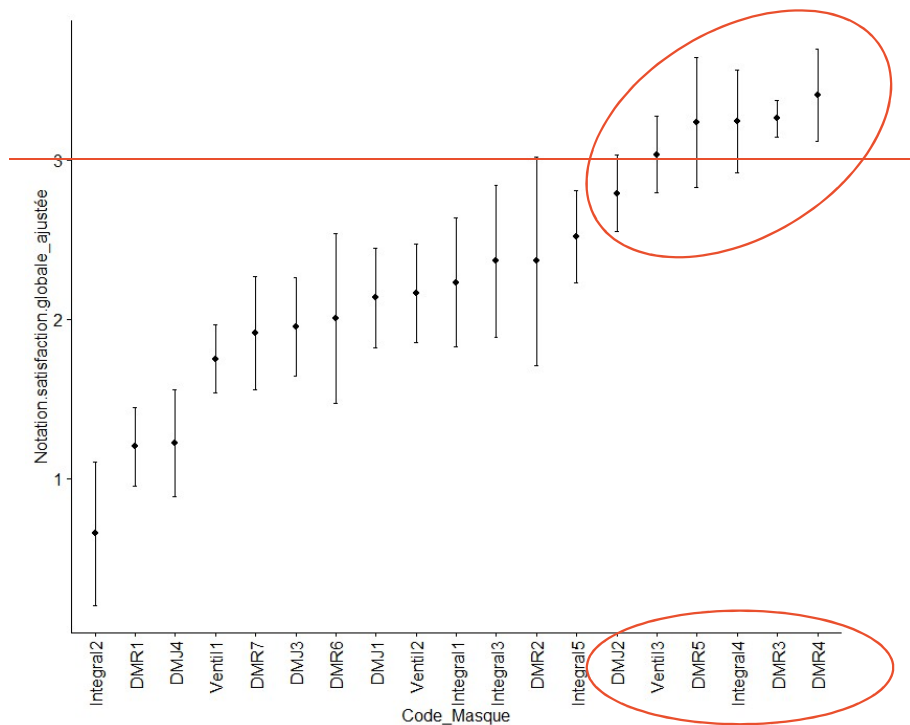
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# Conclusions

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## Take-home messages

- ✓ Comfort is essential for acceptance.
  - ✓ The ideal mask doesn't exist.
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  - ✓ Respiratory protection level should be adapted to the task.
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- Decision-support tool within the QualiAir project.

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Questions ?





# Evaluation of User Satisfaction with Respiratory Protective Masks in Poultry and Pig Farming



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Research engineer specialised in  
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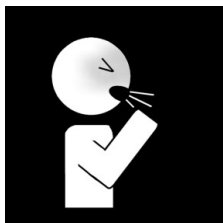


s-agriculture.fr

Pictures: Brittany Chamber of agriculture and Creative commons

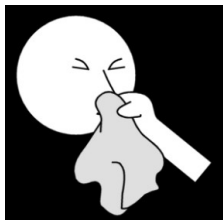


# Why is this project needed ?



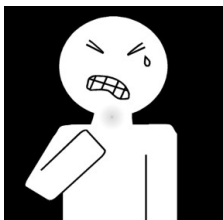
## Dust

- Penetration in the pulmonary alveoli ( $<4\text{ }\mu\text{m}$ )
- Carrier of pathogens



## Ammonia

- Respiratory tract irritation
- Water-soluble > mucous membranes (nose, eyes, throat)



## Inorganic vapors

- Skin irritation
- Intoxication

Can cause respiratory diseases



1

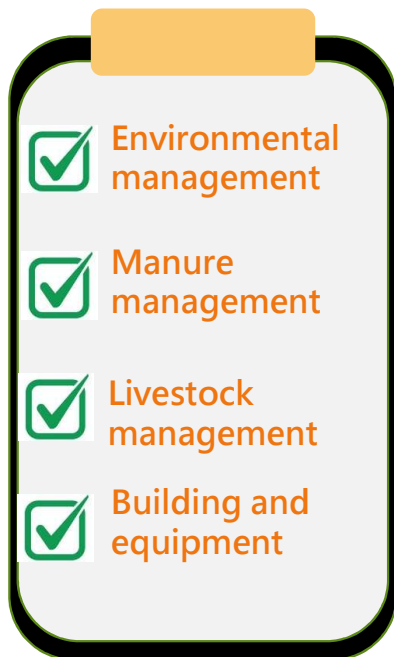
## Objective

To identify respiratory protective masks that farmers are willing to wear in real working conditions.

# The QualiAir Project



## Respiratory risk self-assessment



## Risk level assessment

### Risk level



## Recommended preventive measures



**PREVENTION :**  
Reducing dust exposure



**PROTECTION**

**The tool was designed with 24 pig and poultry farmers involved in the project from beginning to end.**

# Study design

## Respiratory masks selection



## Masks evaluation in real farm conditions



# Evaluation and statistical analysis

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## Evaluation form

Description of tests conditions:  
Mask tested, tasks performed,  
duration of the tasks, time of the  
tests

Ratings :

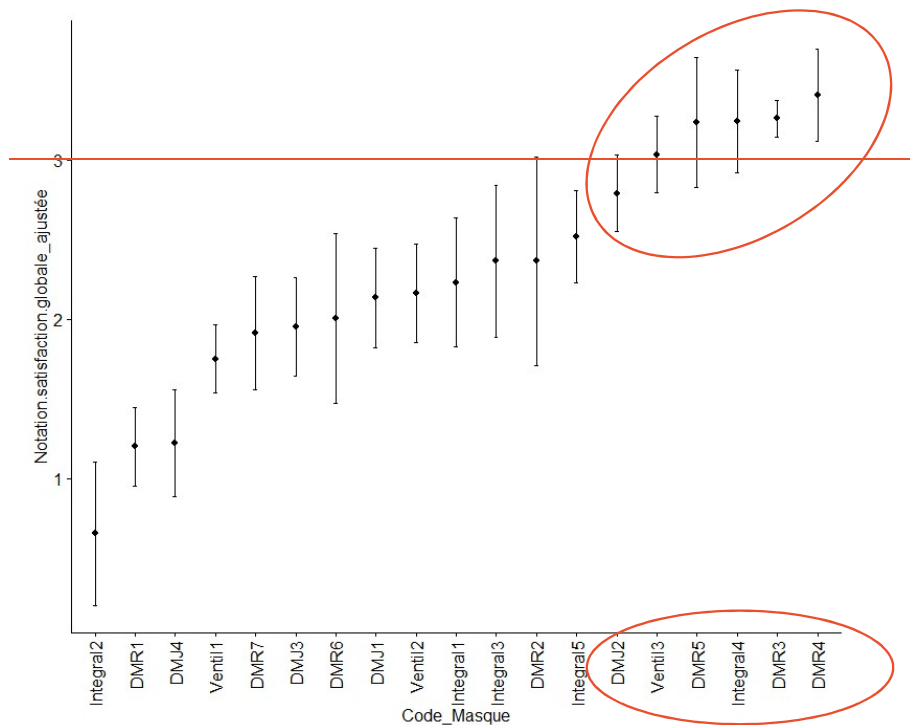
- Overall satisfaction
- 14 criterias (comfort, efficiency, ease to use, compatibility with other equipments,...)

Comments :

- Pros and cons
- Features they would retain to design the ideal mask

- ❖ Qualitativ analysis of all the evaluation forms collected from the 58 testers
- ❖ Not every participant tested every mask  
=> Only 31 testers out of 58 were included in the statistical analyses
- ❖ CATDES : to compare the mean scores for each mask with the overall mean scores, for each criterion.

# Overall satisfaction



Notation :  
 0 – Not satisfied 1- Slightly satisfied  
 2 – Moderately satisfied 3 – Satisfied  
 4 – Very satisfied

## Top performers

- 3 reusable half masks : DMR3, DMR4, DMR5
- 1 full-face mask : Integral4
- 1 powered respirator : Ventil3
- 1 disposable mask : DMJ2

5



# Why were these masks preferred ?

| Mask        | Easy to put on | Ability to fit face shape | Good field of vision | Easy to breathe | Easy to communicate | No itchings | Lightness  | Easy to put remove | No marks on the face |
|-------------|----------------|---------------------------|----------------------|-----------------|---------------------|-------------|------------|--------------------|----------------------|
| DMJ2        | 3,6±0,7        | 3,7±1,0**                 | 3,8±1,0*             | 3,0±0,7         | 2,9±0,2             | 2,9±0,7     | 4,2±0,3*** | 3,9±0,4***         | 3,0±0,6**            |
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| What is important for them      | Positively mentioned features                  | Features which can be improved                                             |
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# Conclusions

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## Take-home messages

- ✓ Comfort is essential for acceptance.
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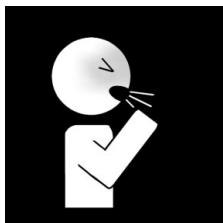


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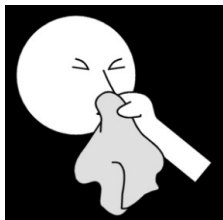


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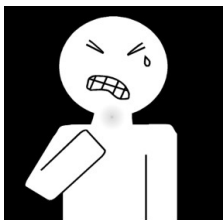
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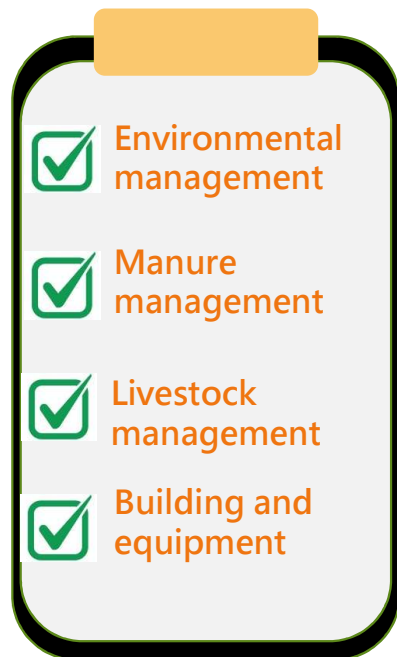
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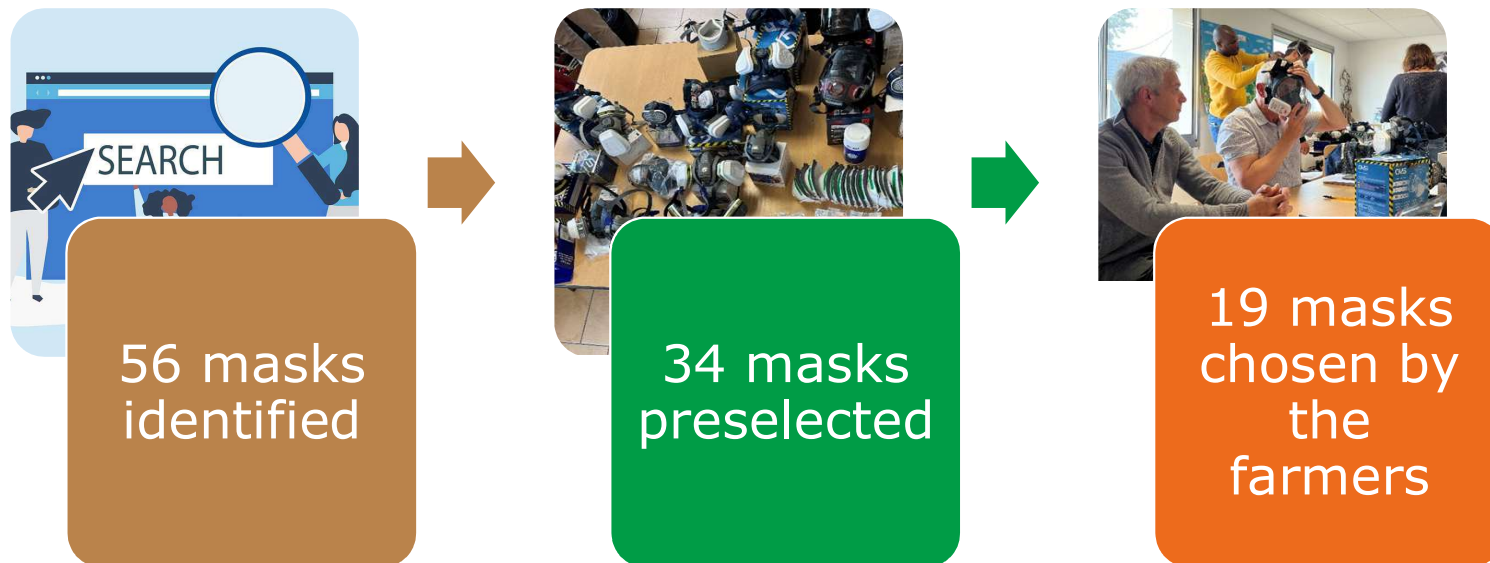


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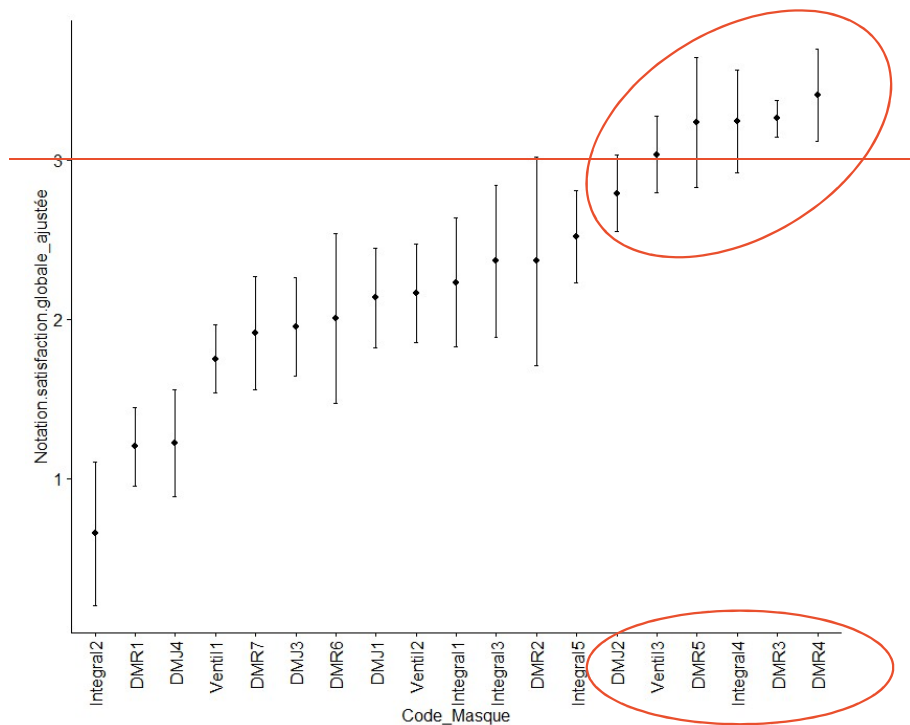
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