Respiratory diseases and allergy in farmers working with large animals and Poultry: A EAACI Position paper

Appendix 1 Search strategy Update: (sept 2019)

1.1 Restrictions:
   1. Farm work-related exposures
   2. Livestock: cattle or or swine farming
   3. (work-related) asthma and rhinitis and COPD, in adulthood

1.2 Exclusion:
   - farm childhood exposure vs asthma/rhinitis/allergy in children
   - ODTs, HP
   - URT and LRT infectious disease

1.3 Comments/questions & in/exclusion:

Focus (see also objectives of Task Force):

   1. Epidemiological studies on incidence/prevalence of asthma and rhinitis in farmers/farm workers
   2. Studies on exposure in livestock farming – any (major) qualitative (other agents?) or quantitative changes during last decades, due to upscaling of livestock farming?
   3. Dose-response relations between exposure levels and the risk of asthma/rhinitis among farmers/farm worker?
   4. New insights re the pathogenesis of farm-related asthma and rhinitis
   5. The paradox: farm exposure’s protection against asthma/allergy/rhinitis ↔ farm-exposure as risk factor for asthma and rhinitis?
   6. Prevention measures: effectiveness of primary and/or secondary prevention?

For these topics strict focus on primary literature from the last 10-15 years – studies performed (=data collected) after 2000. In case of abundance in one or more of the 5 focus areas, selection with as criteria:

   - ~equal numbers of primary papers (if possible, at least 5-10) in each of the six focus areas;
   - date of publication (or better: study date/period); priority for most recent papers
   - geographical distribution/coverage – trying to incorporate studies from a variety of geographic regions worldwide (restriction to industrialized world)
Literature Search strategy (MEDLINE/PubMed)

1.3.1 Step A:
A series of papers on respiratory health risks (priority: asthma and rhinitis) and associated exposure factors in livestock farming; published 2011-17 – mainly reviews:

| Authors            | Journal                        | PY    | Topic                                           |
|--------------------|--------------------------------|-------|-------------------------------------------------|
| Basinas et al.     | J Exp Sci Environ Epidemiol   | 2015  | Exposure                                        |
| Bolund             | Occup Environ Med              | 2017  | Dose-response lung function                     |
| Luong Thanh        | Cochrane Rev                   | 2016  | Prevention in Occup settings                    |
| May                | J Tox Env Health               | 2012  | Mechanisms                                      |
| Nordgren & Bailey  | Curr Op Resp Med               | 2016  | General/clinical/diagnosis                      |
| Poole              | Ann Asthma Allergy Immunol     | 2012  | Exposure factors                                |
| Poole & Romberger  | Curr Op Allergy Clin Immunol   | 2012  | Mechanisms                                      |
| Reynolds           | J Agromed                      | 2013  | General dairy farming                           |
| von Essen          | J Agromed                      | 2010  | Prevention/NIOSH recommendations                |
| Wunschel & Poole   | J Asthma                       | 2016  | General/risk factors                            |

1.3.2 Step B:
Inventory of all MeSH terms added in MEDLINE to these papers; MESH terms sorted on frequency with which they were. After exclusion of terms considered non-specific or not relevant, and terms used only once (numbers give frequency of use):

| MeSH term                                      | #  |
|-----------------------------------------------|----|
| Occupational Exposure                         | 12 |
| Animals                                       | 8  |
| Endotoxins/adverse effects                    | 7  |
| Dust                                          | 7  |
| Lung Diseases/chemically induced*             | 6  |
| Air Pollutants, Occupational/adverse effects  | 5  |
| Occupational Diseases*/epidemiology           | 5  |
| Pulmonary Disease, Chronic Obstructive/epidemiology | 5  |
| Agriculture*                                  | 4  |
| Agricultural Workers' Diseases/chemically induced* | 4  |
| Asthma/epidemiology                           | 4  |
| Animal Husbandry*                             | 3  |
| Respiratory Tract Diseases/epidemiology       | 3  |
| Bronchitis, Chronic/epidemiology              | 3  |
| Aerosols                                      | 2  |
| Cattle                                        | 2  |
| Dairying                                      | 2  |
| Livestock                                     | 2  |
| Swine                                         | 2  |
| Hypersensitivity/epidemiology                 | 2  |
1.4.3  Step C:
Check position of these terms in MeSH thesaurus tree (eg. asthma and rhinitis in the tree of 'respiratory tract diseases'; 'livestock' in tree 'animals')

1.4.4  Step D:
Search in Pubmed/MEDLINE for items indexed with "MESH terms" or "MESH major topics"

| Set | Search | Search term / combination | #hits |
|-----|--------|---------------------------|-------|
| 1   | #2     | Occupational exposure     | MeSH  | 61.209 |
| 2   | #3     | Occupational exposure/adverse effects | MeSH | 19.523 |
| 3   | #4     | Dust                      | MeSH  | 21.590 |
| 4   | #5     | Aerosols                  | MeSH  | 30.333 |
| 5   | #6     | Endotoxins/adverse effects | MeSH | 13.780 |
| 6   | #7     | Air pollutants, Occupational/adverse effects | MeSH | 7.081 |
| A   | ANY (#2;#4-#7) |                           |       | 124.447 |
| A1  | ANY (#3;#4-#7) |                           |       | 86.933  |
| 7   | #12    | Agriculture               | MeSH  | 91.051 |
| 8   | #13    | Animal husbandry          | MeSH  | 20.401 |
| 9   | #14    | Dairying                  | MeSH  | 11.729 |
| 10  | #15    | Farms                     | MeSH  | 1.631  |
| 11  | #16    | Cattle                    | MeSH  | 341.390 |
| 12  | #20    | Swine                     | MeSH  | 231.576 |
| 13  | #21    | Livestock                 | MeSH  | 3.184  |
| B   | ANY (#12- #16; #20-#21) |                           |       | 608.084 |
| 14  | #23    | Respiratory tract diseases | MeSH | 1.295.91 |
| 15  | #24    | Asthma                    | MeSH  | 124.190 |
| 16  | #25    | Rhinitis                  | MeSH  | 33.156 |
| 17  | #26    | Pulmonary Disease, Chronic Obstructive | MeSH | 52.575 |
| 18  | #27    | Lung diseases             | MeSH  | 851.713 |
| 19  | #28    | Bronchitis, chronic       | MeSH  | 1.724  |
| 20  | #29    | Hypersensitivity          | MeSH  | 334.692 |
| C   | ANY (#4; #5; #12; #25; #27; #28; #29) |                           |       | 1.496.52 |
| 21  | #31    | Agricultural Workers' Diseases | MeSH | 6.535  |
| 22  | #32    | Farmers OR workers OR occupational | Title or Abstract | 261.287 |
| D   | #31OR #32 |                               |       | 264.470 |
| E   | A1 AND B AND C |                      |       | 798    |
| F   | E and D |                           |       | 377    |
| G   | F and PY >1999 (published since 2000) |                        |       | 266    |