EVERI paper on “Veterinarians employed in industry”

SUMMARY

Background and purpose of the document

Veterinary expertise is needed to provide wholesome and affordable healthcare solutions to ensure safe food and feed, protect people against zoonotic infections and help pets and their owners enjoy a long and healthy life together. Through their wide knowledge and competences in the areas of animal health, human health, environment and the interdependencies between these areas, veterinarians play an increasingly important role in our society, thus serving the community. The veterinarian’s share in the important concept of “One Health” can be seen as an evolution of the much longer existing concept of “Veterinary Public Health”. In line with the EVERI Strategy and Objectives 2020-2022 – “promote the work of veterinarians working in industry and to this aim work in collaboration with other professions” – a paper has been developed to reflect on the challenges and opportunities for veterinarians working in the Animal and Human Health (AHH) and for those working in Agri-Aqua & Food-Feed (AAFF) Industry.

Demography

According to the FVE Surveys, veterinarians working in ‘education and research (11% in 2018 and 6% in 2015) and ‘private research and industry (4% in 2018 and 2015) are a significant part of the profession. It is also indicated that 13% of veterinarians have education and research as their field of second employment while 8% have food hygiene as a complementary job. The coming 2022 FVE demographic survey on the veterinary profession in the EU envisages providing a more detailed depiction of the specific sector in which veterinarians are occupied in Education, Research and Industry.

Roles and responsibilities

In the AHH industry, veterinarians may be employed by various types of companies, like Human Health Pharmaceutical and Biotechnology Companies, Animal Health Companies, Animal Supply Companies, Agrochemical Companies, Diagnostic Laboratories and Wholesale and retail distributors. The roles and responsibilities of veterinarians in these companies range from basic research and Pharmacology to preclinical and clinical development, manufacturing and distribution, Quality control/Quality assurance, Regulatory affairs and post-marketing surveillance. Vets are heavily involved in Scientific information/technical support and sales and marketing.

The employers in the agrifood and feed sector can be the manufacturers, trade bodies or retailers, but also consumer organizations, insurance companies, charities or animal welfare organizations. Also in this sector vets can be employed in quality assurance schemes, consumer technical support and sales and marketing. Veterinarians are employed & contracted directly or indirectly, part- or full-time, with different degrees of responsibility within the organization.

Skills and competences

The ECCVT (European Coordinating Committee on Veterinary Training) has identified 36 Day One Competences which of course also form the basis for the different roles and responsibilities of veterinarians working in the industry. However, not all of these 36 competences may be equally

important for veterinarians working in industry, while additional competences may have to be defined: for instance, how to understand and deal with the complex system of EU regulations.

In general, a career in the industry requires an open, curious, and flexible mindset with a certain resilience to continuous change. Apart from the scientific and technical skills, which continuously need to be developed further, knowledge of IT, business administration, economics and politics are helpful or may even be a prerequisite. Good communication skills and the capability to work in teams, cross-functional and even multinational structures are essential.

Some, but not many, formalised training programs are available and some employers provide their targeted training to develop specific skill sets. The development of specific postgraduate training programs to further expand these skills, competencies and qualifications should be taken into consideration.

Contribution to the society

Veterinary expertise is needed to provide wholesome and affordable healthcare solutions to ensure safe food and feed, protect people against zoonotic infections, contribute to sustainable production and help pets and their owners enjoy a long and healthy life together. Solutions in the field depend on the work of veterinarians in the industry. The added value and the contribution to society of this part of the profession deserve to be emphasized, and the visibility of veterinarians working in industry, both in and outside the veterinary community, need to be increased.

The opportunity for career pathways alternative to clinical practice has been explained and promoted by EVERI in collaboration with the International Veterinary Student Association (IVSA). The FVE campaign “Vets are everywhere” underlined how vital the profession is for animals and people but there is still the need to work together with the whole profession, practitioners and official veterinarians, to show how veterinarians contribute to society via the very different set of competences. Overall, the joint effort will allow the whole veterinary profession to increase its reputation in the general opinion.

Conclusions

The veterinary profession is very diverse. Although the veterinary profession is mainly devoted to clinical practice, alternative career pathways aimed to develop different expertise are essential to ensure the development of the integrated approach defined as “One Health”.

EVERI encourages veterinarians in exploring these fascinating career pathways and calls all the relevant stakeholders to cooperate to develop appropriate training initiatives to further develop and maintain the competences needed for these sectors and to increase the awareness of the added value and the contributions to society of veterinarians working in industry.

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Contents

1. Introduction

In line with the EVERI Strategy and Objectives 2020-2022[1] – "promote the work of veterinarians working in industry and to this aim work in collaboration with other professions" – it has been considered relevant to develop a reflection paper on the challenges and opportunities for veterinarians employed directly and indirectly by the industry, with special focus on veterinarians working in the Animal and Human Health (AHH) and for those working in Agri-Aqua & Food-Feed (AAFF) Industry.

2. Objectives

The objectives of this paper are to:

- Analyse information regarding the demography of the veterinary profession and trends in the number of veterinarians working in industry.
- Map the specific roles and responsibilities covered by veterinarians in the different areas.
- Identify specific skills, competencies and additional qualifications required to successfully perform the various tasks of a veterinarian working in industry.
- Discuss the added value and the contributions to society of veterinarians working in industry
- Encourage veterinarians to consider this career and work together with the different areas of the veterinary profession in the view of developing the concept of "One Health"

3. Demography

According to the 2018 FVE Survey, the most common sector for the estimated 309,144 veterinarians in Europe (in 39 FVE member countries) is the private sector, in which 58% of the veterinarians are working either as practice owners (27%) or as employees (31%). These figures are similar to those observed in the 2015 survey (60% in private practice, with 35% being owners and 25% being employees). Veterinarians working in public service form the second group: 14% in 2018 and 19% in 2015.

Veterinarians working in Education and research (11% in 2018 and 6% in 2015) and in Private research and Industry (4% in 2018 and 2015) represent a significant part of the profession. Differences among EU Countries can be noted: the percentage of veterinarians working in education and research is relatively high in countries like Turkey (47%), Switzerland (32%) and Belgium (18%) and relatively low in countries like Spain (5%) and France (2%). The percentage of veterinarians working in private research and industry is relatively higher in Switzerland (9%), Germany, Spain and Belgium (7%) and lower in France, Sweden and Poland (2%). A comparison of the 2015 and 2018 figures shows that there seems to be a tendency toward an increasing share of veterinarians working in the sector of education and research (from 6% to 11%).

The 2018 FVE Survey shows that, in addition to their main field of employment, 36% of the veterinarians in Europe have a second occupation and 13% of them have education and research as their field of second employment. Eight per cent have food hygiene as a second occupation, but in some countries such as Austria and Ireland, the numbers are significantly higher (more than 25%).

[1] https://bit.ly/3LRbYIK

The 2018 survey of FVE, indicates that veterinarians occupied in food hygiene are of the highest earning veterinary-trained professionals along with those working in consultancy.

Despite the already available data, some further specifications and clarification may be desirable. For instance, there may be some overlap in the FVE Survey categories ‘education and research and ‘private research and industry’: both sectors contain the word research. Furthermore, the combination of ‘education’ and ‘research’ in one group makes it difficult to determine to what extent employment in the pharmaceutical industry is involved among the veterinarians that have indicated to work in the research area. Furthermore, it has to be considered that the dissemination of the FVE survey among veterinarians that are not a member of an FVE-associated national organization may not have been effective in all countries, as a consequence of which their employment data may be underrepresented.

More specific data regarding demography will be collected with the 2022 FVE. Respondents will be requested to indicate which sector they are working on, choosing one or more of the following options:

- Food production (meat, dairy, fish)
- Feed production for animals
- Pharma (human)
- Pharma (veterinary)
- Medical devices
- Quality assurance
- Other services to the veterinary profession

4. Roles and responsibilities

4.1 Animal and Human Health Industry

Veterinarians working in the animal and human health industry may be employed by various **types of companies** in this sector. An overview:

- *Human Health Pharmaceutical and Biotechnology Companies*: in the past, biotechnology companies were defined by their emphasis on drug discovery, while pharmaceutical companies were better equipped to take candidate drugs through clinical trials, manufacturing, sales and marketing. However, this trend is changing, as biotechnology firms are evolving into integrated companies, retaining ownership of their developmental compounds and continuing to build in-house sales and marketing functions.
- *Animal Health Companies*: represent three main business areas – veterinary pharmaceuticals and biologicals, veterinary biotechnology, and veterinary diagnostics. Like their counterparts in human drug discovery and development, their activities are highly regulated and must meet the same rigid specifications for safety and efficacy.
- *Animal Supply Companies*: provide specialized, genetically, and microbiologically defined laboratory animals and other services to meet the needs of the pharmaceutical, biotechnology, food, and contract research industries, as well as universities, medical centres and government agencies engaged in biomedical research.
- *Agrochemical Companies*: manufacture herbicides, insecticides, fungicides and other pesticides to protect both crops and animals.
- *Diagnostic Laboratories*: provide veterinary diagnostic services for companion animal medicine and laboratory animal medicine. Veterinary diagnostics are part of any national animal health infrastructure that is of utmost importance in overcoming major epidemics or needs related to food contamination. Contract research organizations (CRO s) provide services to

pharmaceutical and biotechnology companies by performing pre-clinical and clinical trials on new drug candidates, using animals supplied by lab animals suppliers.

- *Wholesale and retail distributors*: stock and distribute animal health products.

The **roles and responsibilities** of veterinarians in these companies take place in a wide scope of possible working areas like technical expertise, regulatory, marketing, sales, and research. A detailed overview of available functions, prepared by the German Group of Veterinarians in Industry (Fachgemeinschaft Industrietierärzte, FIT) forms the basis for the following list of possible working areas:

- *Basic research and Pharmacology*: discovery and development of new compounds including research into innovative modes of action, and identification of new antigens for vaccines and diagnostics.
- *Pharmaceutical development*: discovery and development of new formulations for drugs and vaccines and ways to administer these to various animal species, taking into account the chemical, pharmacological and biopharmaceutical properties of the compounds involved.
- *Pharmacokinetics and metabolism*: evaluation and determination of the bioavailability of drugs in various animal species and using various routes of administration to deliver the most effective formulations and dosages. In these first three areas, veterinarians may work i.e. as research scientists, managers or heads of scientific affairs etc.
- *Clinical testing*: development, execution, analysis, and reporting of clinical studies in both target and laboratory animals in compliance with all applicable rules and regulations (designated veterinarian’s role). In this area, veterinarians may work i.e. as clinical research associates, managers or head clinical affairs etc.
- *Manufacturing*: production of pharmaceuticals and biologicals according to industrial standards (GMP) and all applicable rules and regulations.
- *Quality control*: development and execution of methods to measure and safeguard the quality of produced pharmaceuticals and biologicals. In these latter two areas, veterinarians may work as managers of production, quality control manager etc.
- *Pharmacovigilance*: collection, analysis, recording and reporting of all possible side effects of veterinary pharmaceutical and biological products in compliance with the rules and regulations as determined by the EMA. In this area, veterinarians may work i.e. as a drug safety manager, manager or head pharmacovigilance etc.
- *Regulatory affairs*: composition, updating and filing of regulatory dossiers and assuring that promotion of veterinary products is done in line with the approved product information texts. Handling cascade and off-label use queries is also a part of this responsibility. In this area, veterinarians may work i.e. as authorisation referent, regulatory affairs manager etc.
- *Scientific information/technical support*: staying informed and up-to-date about all clinical and scientific data regarding veterinary products and the disease areas that they are used in, and the use of this information to train industry staff and to educate veterinarians and animal owners via various channels about the proper use of these products. In this area, veterinarians may work i.e. as technical services managers.
- *Sales and marketing*: development and execution of concepts and campaigns to promote and support the use of veterinary products to all relevant stakeholders in the veterinary

market. In this area, veterinarians may work i.e. as product managers, (key) account managers, sales managers etc. Key opinion leader management will be part of this area and the hereabove mentioned area of technical support.

- *Distribution*: ensuring proper storage and distribution of veterinary pharmaceuticals and biologicals in compliance with all applicable rules and regulations regarding storage conditions, opioid legislation etc. In this area, veterinarians may work i.e. as distribution managers.
- *Legal affairs and liability*: veterinary professional evaluation of issues in areas like health cost insurance, complaint handling and company liability. Although this requires, in essence, a legal background there may be a role for veterinarians in this area as veterinary specialists or consultants.
- *Animal husbandry, hygiene and welfare*: breeding, care and handling of animals used in studies including the coordination of all measures to comply with existing rules and regulations concerning the responsible use of laboratory animals and animal welfare. In this area, veterinarians may work i.e. as designated veterinarians, head animal centres etc.
- *Public Affairs and lobbying*: in the continuously changing fields of animal health, human health and the environment veterinarians may be increasingly important to make a difference on a larger scale, widening their networks with stakeholders like farmers' organizations, government institutions, politicians and corporate companies.

4.2 Agri-Aqua & Food-Feed Industry.

Veterinarians working in the food and feed industry can use and do use, some of the veterinary undergraduate competencies, usually as members of a multidisciplinary team. They may be, or may not be registered with the National Statutory bodies or Associations and be employed & contracted directly or indirectly by various types of companies, part or full time. Their role involves simple or more complex jobs (technical, management, consultancy) in different areas such as:

- Food and feed production,
- Trade bodies,
- Charities (NGOs),
- Consumer protection organisations,
- Animal welfare organisations (farm & slaughter),
- Assurance schemes,
- Insurance companies.
- Farming-Food sector (Breeding industry, AI centres, Food/ Feed production)
- Retail sector (Hotel & Restaurant & Catering & supermarkets, pet shops etc.)
- Alternative protein source /Insect production,

Table 1 (in attachment), gives a non-exhaustive list of examples of AAFF industry vets' work.

5. Skills and competences

Identification is needed of the specific skills, competences and additional qualifications required to successfully perform the various tasks of a veterinarian working in the pharmaceutical industry. The ECCVT (European Coordinating Committee on Veterinary Training) issued on January 17th 2019 a document listing the requirements of the overall basic veterinary competence in line with all relevant EU legislation. Competence is defined as a concept that integrates knowledge, skills, and attitudes. Competence requires the acquisition of technical skills but further involves applying relevant

knowledge and having the confidence and ability to transfer what has been learnt to a variety of contexts. The so-called ‘Day One Competences’ reflect the minimum standard required and form the starting point for a variety of roles in the veterinary profession. After graduation, ongoing professional development will be needed in whichever field the new graduate decides to enter, and some roles may require postgraduate training and further formal qualifications. In the document, 36 Day One Competences are being identified and of course, these also form the basis for the different roles and responsibilities of veterinarians working in the industry. However, not all of these 36 competences may be equally important for veterinarians working in industry and additional competences may have to be defined, for instance how to understand and deal with the complex system of EU regulations. Performing a SWOT analysis regarding the role of veterinarians working in industry may be a helpful tool to stratify and rank the various competences.

In general, a career in industry requires an open, curious, and flexible mindset with a certain resilience to continuous change. After an entry position, many opportunities can be available during an industry career. Apart from the scientific and technical skills, which continuously need to be developed further, knowledge of IT, business administration, economics and politics are helpful or may even be a prerequisite to take certain positions, e.g. in commercial operations. Good communication skills and the capability to work in teams, cross-functional and even multinational structures are essential. Certain positions, e.g. as a qualified person in quality control require formalised and specific degrees.

For some jobs/ roles, practical veterinary clinical experience is required before any further specialist detailed knowledge of specific disciplines (i.e. microbiology, pharmacology etc.). In all cases good knowledge and practical application of Veterinary Public Health/One Health (including legislative updates) & Communication skills.

Looking at the wideness of the different roles of veterinarians in industry, further professional development is necessary to fulfil the requirements. Some, but not many, formalised training programs are available e.g. in the field of food inspection, regulatory affairs, pharmacovigilance or laboratory animal science. Some employers provide their own targeted training to develop specific skill sets. Business universities, offering courses like MBA may also provide a good opportunity for veterinarians to develop specific skills. The development of specific post-graduate training programs or opportunities to recognize specialization might be a joint request of employed veterinarians and companies.

The development of training programs to further expand these skills, competencies and qualifications should be taken into consideration. Programmes should be developed involving the relevant stakeholders, to better understand the market expectations. National statutory bodies should be involved as well, to make sure that specific qualifications can be awarded and become “visible” to clients.

6. Wider Contribution to the society

Veterinary expertise is needed to provide wholesome and affordable healthcare solutions to ensure safe food and feed, protect people against zoonotic infections and help pets and their owners enjoy a long and healthy life together.

As shown in the previous paragraphs, veterinarians contribute largely to safeguarding animal and human health as well as ensuring ethical research. Their expertise is indispensable to ensure that other veterinarians, working directly with animal owners, can count on a broad portfolio of safe and efficacious medicinal products and other animal health care products. Veterinarians are involved in all necessary steps, starting from research and development to the demonstration of medicinal product quality, efficacy and safety. In all these steps, they safeguard the welfare of the animals that still need

to be used in research, implementing daily the 3 R’s (reduce-refine-replace) and they are involved in the post-marketing surveillance of those products.

Veterinarians working in industry contribute to developing policy and regulations, i.e. developing the industrial standards to be used during official controls and inspections. They also act often in close collaboration with Universities and thus facilitate the exchange of knowledge for the benefit of both undergraduate and/or post-graduate veterinarians as well as society. Veterinarians working in industry are one of the pillars of the veterinary profession, even though they are not always perceived as “real veterinarians”. The veterinary profession is changing more and more in the direction that requires, together with clinical skills, the capacity to interact with complex organizations such as the industry.

The added value and the contribution to society of veterinarians working in industry deserve to be emphasized, and the visibility of veterinarians working in industry, both in and outside the veterinary community, needs to be increased. Networks of veterinarians working in areas outside the clinical practice are already existing in many European countries. The opportunity for career pathways alternative to clinical practice has been explained and promoted by EVERI in collaboration with the International Veterinary Student Association (IVSA). The FVE campaign “Vets are everywhere” underlined how vital the profession is for animals and people but there is still the need to work together with the whole profession, practitioners and official veterinarians, to show how veterinarians contribute to society via the very different set of competences. Overall, the joint effort will allow the whole veterinary profession to increase its reputation in the general opinion.

7. Conclusions

The veterinary profession is very diverse. Veterinarians receive a profound and holistic knowledge of health, welfare and the overall environment where humans and animals live. Although the veterinary profession is mainly devoted to clinical practice, alternative career pathways aimed to develop different expertise are essential to ensure the development of the integrated approach defined as “One Health”: veterinarians deeply understand the interdependences of humans, animals, and the environment. The concept of “Veterinary Public Health” was already known and valued long before the concept of “One Health” was introduced.

Veterinarians bring true added value to the industry through their wide knowledge and competences. On the other hand, the industry could be really a motivating environment for the veterinarian as it offers a wide range of different roles, where veterinarians could find their place and thrive. The wider society asks for high-quality services from healthcare providers - often without knowing that the quality of those services depends on the solutions that veterinarians working in the industry develop, both for animal and human health.

EVERI encourages veterinarians in exploring these fascinating career pathways and calls all the relevant stakeholders to cooperate to develop appropriate training initiatives to further develop and maintain the competences needed for these sectors and to increase the awareness of the added value and the contributions to society of veterinarians working in industry.

8. References

- VetSurvey: Survey of the veterinary profession in Europe (Federation of Veterinarians of Europe, FVE, October 2019)
- Overview of functions of veterinarians in industry prepared by the German Group of Veterinarians in Industry (Fachgemeinschaft Industrietierärzte, FIT), provided upon request
- EVERI Strategy document 2020-2022: https://everi.fve.org/cms/wp-content/uploads/EVERI-strategy-2020-2022-nov_2019.pdf
- Overview of day one competencies
- FVE Position Papers:
    - Veterinarians are vital for animals & people
    - Veterinarians care about your food
    - Veterinarians commit to sustainable food systems
    - FVE-CVMA-AVMA joint statement - The essential role of veterinarians in protecting animal, human, public, and environmental health – a global public good
      World Health Organization (WHO) - One Health definition

Table 1: Non-exhaustive list of examples and benefits of AAFF industry vets' work

SECTORS	WHAT AAFF Industry Vets do?	BENEFITS
FARMING (*) FOOD FEED RETAIL	• Farming: GFP/ Quality assurance schemes • Breeding centers (AI, etc.) • Feed & medicated feed production • HACCP systems and other Food /Feed Safety Systems • IFS - BRC certified quality management systems (and feeds) • Self-control systems for exportation of foods/feeds • Other differentiated quality systems - • Customer-specific systems and requirements, e.g. retailers or other international food/feed industries • Food/feed processing, facilities and machinery • Packaging and conservation – Food /Feed • Cleaning and disinfection- Food – Feed • Labelled- Food -Feed • Traceability- Food /Feed • Procedures with the competent authorities: registration modification, rectification or cancellation – Food/ Feed • Dialogue with Food / Feed health authorities and other quality/safety departments and academic institutions • Waste Specific Honey bees & Aqua food- feed examples: • Wax production and recycling, including sterilisation phase, and controlling for possible adulterations • Genetic material e.g. for AI of honeybee queens • Prevention and final disinfection protocols at apiary / fish farm	**ENVIRONMENT and BIODIVERSITY** Contributing to 17 UN SDG https://sdgs.un.org/goals **ANIMALS** Better health & nutrition, animal welfare. **PEOPLE** **Direct impact:** zoonoses, consumer protection etc. **Indirect impact:** Food & feed production, & trade etc. **FARMERS/ & OTHER PRODUCERS IN AA&FF Industry** Increased compliance, reduced cost, consumers trust, commercial advantage **GOVERNMENT & INTERNATIONAL BODIES**

SECTORS	WHAT AAFF Industry Vets do?	BENEFITS
	• Fish / shellfish / Cephalopods - species specific aspects of welfare / production etc.	Reviewing or introducing new policies/ laws, rules, regulations, standards (traditional production) e.g. consultations, international trade **'OTHER' VETS** **Practitioners** (helping with feedback information) - Food producing animals - Companion e.g. small animals (feed industry) **Official Vets** (helping them with) - Policy development - Standard setting - Statutory sampling - International trade - Implementing the above and official inspections **Researchers/Educators** (helping them & facilitating) - All aspects of teaching (under & postgraduate) - Sampling/ Surveillance for other purposes
AUDITING (**)	• Audit of processes and facilities e.g. before purchasing a company • Auditing quality/safety systems • Internal audits e.g. ISO, IFS, etc	
DESIGNING STRUCTURAL & EQUIPMENT (**)	• Sanitary projects, initial designs (Important for GHP- Sustainable Production) • Waste disposal (animal, human, laboratory infective material, environment protection) • Reforms of facilities for expansion/adaptation • Adapted sanitary circuits • Provision of facilities • Focused on activity, customers and quality management systems	
TRAINING (**)	• Food handlers, GFP, GMPs, GHP • Sanitary training "in situ" in the process itself (e.g. slaughterhouses, and other food & feed production areas e.g fish, honey, evaluation and training in GFP, GMPs, GHP • Specific programs with other entities • Official authorities and others	
INSPECTION/ASSESSMENT/SURVEY (**)	• Dilapidation survey • Trade surveys • Assurance claims • Claims and litigation both between companies and at the judicial level. • Support as an expert in court. • Validation	

SECTORS	WHAT AAFF Industry Vets do?	BENEFITS
LABORATORY TESTS (**)	• Food/Feed laboratory tests: microbiological, chemical, residues, additives, others • Early diagnostic and surveillance programs • Food Contact Surfaces • Expiration tests • Validation	

(*) Also fish & shellfish, different bees (honey, bumble bees) & various insects for food & feed, & less common species e.g. rabbits, ostriches, etc.)

(**) Applicable to farms, food, feed and retail