The role of extramural research in the development of new feed additives

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Content

- Feed additives – events and challenges since 1990
- Development of feed additives – main phases and activities
- Role and importance of extramural research

Events which influenced the use and development of feed additives

1990 – 1995	Market launch of feed enzymes (phytase, NSP-degrading enzymes) as a new category
1995 – 2000	Avoparcin „case“ and subsequent partial ban on several feed antibiotics in the EU (and quinoxaline derivatives as well)
October 2003	European Parliament and Council Regulation No. 1831/2003 adopted
January 2006	Total ban on all feed antibiotics in the EU
April 2008	Guidelines for submission for authorisation of additives adopted
November 2010	Deadline for submission of registration dossiers for all currently approved products

Regulation (EC) No. 1831/2003: Important decisions

- Ban on antibiotics as feed additives has been implemented within Article 5 (Conditions for authorisation).

- Categories of feed additives have been newly defined (Article 6).

- Authorisation process for feed additives has been modified:
  1. Submission to the Commission
  2. Evaluation by the European Food Safety Authority (EFSA) and its expert panels (e.g. FEEDAP)
  3. Final approval by the Commission

- The Commission should establish new guidelines for the authorisation of feed additives in cooperation with EFSA.

- Community Register of Feed Additives has been established.

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New EU categories of feed additives*

a) **Technological additives** (e.g. preservatives, antioxidants, emulsifiers, acidity regulators, silage additives)

b) **Sensory additives** (e.g. flavours, colorants)

c) **Nutritional additives** (e.g. vitamins, minerals, amino acids, trace elements)

d) **Zootechnical additives** (e.g. digestibility enhancers, gut flora stabilizers)

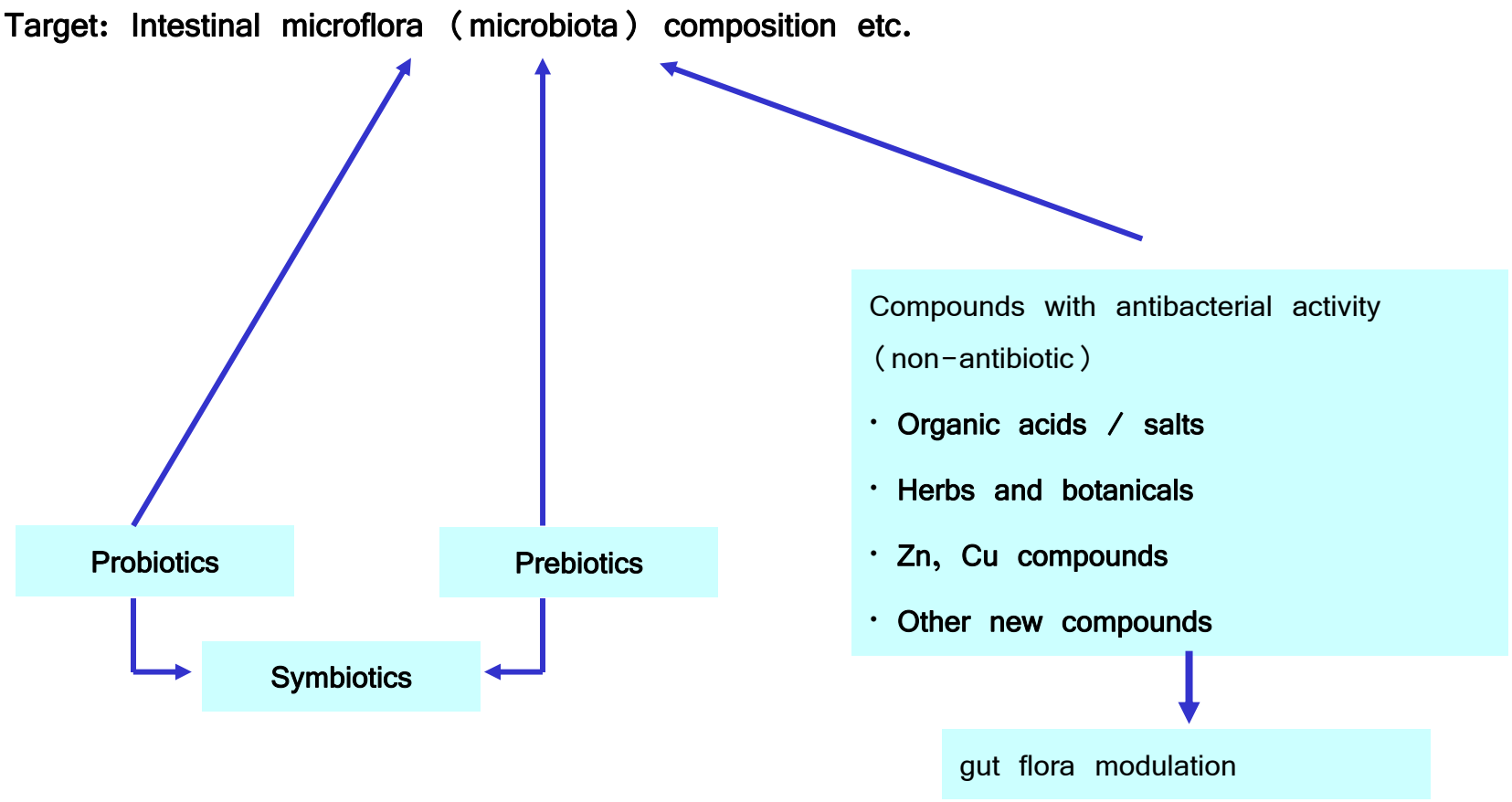
e) **Coccidiostats and histomostats**

* Established by Regulation No. 1831/2003, Article 6

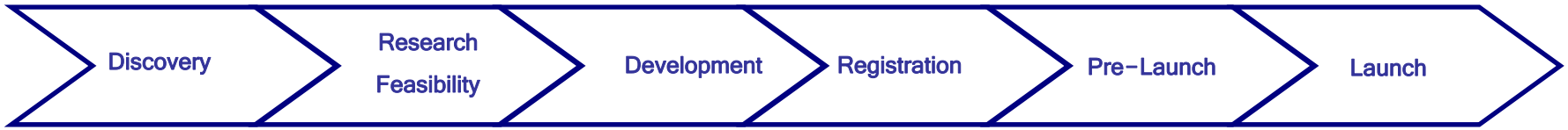
Functional groups of zootechnical additives

- Digestibility enhancers （substances, which increase the digestibility of the diet, through action on target feed materials）
- Gut flora stabilizers （microorganisms or other chemically defined substances, which, when fed to animals, have a positive effect on the gut flora）
- Substances that favourably affect the environment
- Other zootechnical additives

How to replace feed antibiotics?



Development of a new feed additive: Main phases and activities



Definitions:

- Intramural R&D – activities conducted by companies in their respective internal research facilities

- Extramural research – R&D activities conducted by external partners, such as
  - Universities
  - Governmental R&D organizations (e.g. IRTA, INRA)
  - Contract research organizations (CROs)

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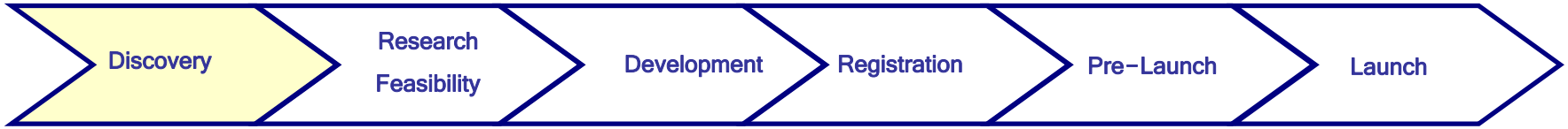
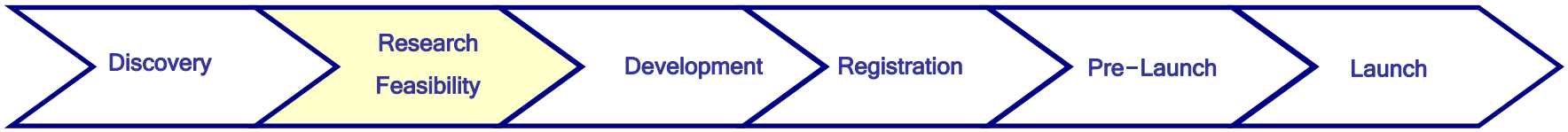
Development of a new feed additive: Main phases and activities



Discovery: Initial screening (e.g. *in vitro* antibacterial activity), identification of development candidate, efficacy testing in target animals

Such initial activities are usually conducted by indutrial research in order to establish and protect the respective IP position. However, efficacy testing in target animals can be also conducted with external R&D partners.

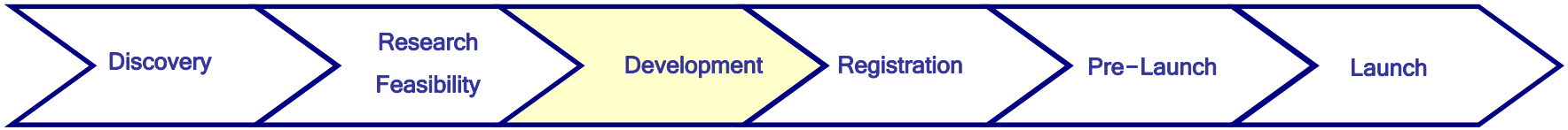
Development of a new feed additive: Main phases and activities



Research / Feasibility:	Evaluation of production process, feasibility of product formulation, product analytics, initial safety program, dose-titration and efficacy trials in farm animals

Activities like product analytics, dose-titration and efficacy trials in target animals can be well carried out in collaboration with external R&D partners.

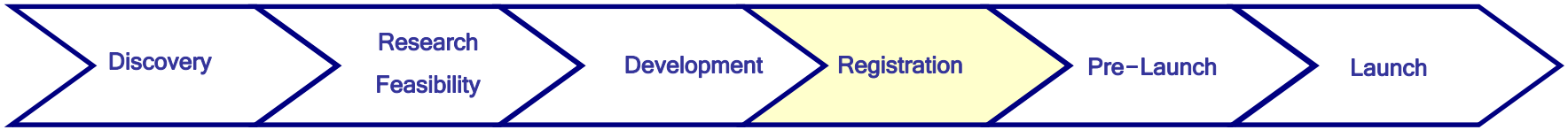
Development of a new feed additive: Main phases and activities



Development: Development and scale-up of production process, development of final formulation, in-feed product analytics, full toxicological testing, efficacy and tolerance trials in target species and categories

Toxicological testing is usually conducted by specialized external CROs. In order to meet regulatory requirements efficacy and tolerance trials have to be carried out in collaboration with external research partners.

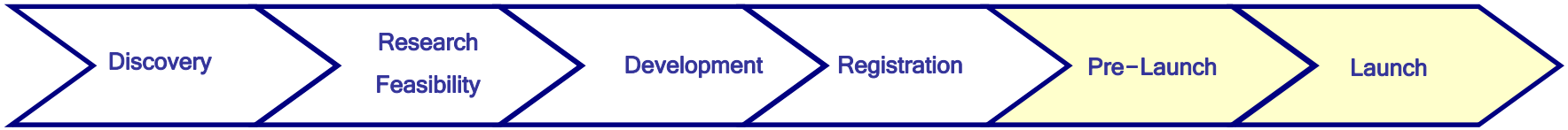
Development of a new feed additive: Main phases and activities



Registration: Elaboration of registration file, submission of a dossier to registration authorities

The companies are usually taking care for registration activities directly. However, many smaller or start-up companies are also working with a specialized parterns providing service in this area.

Development of a new feed additive: Main phases and activities

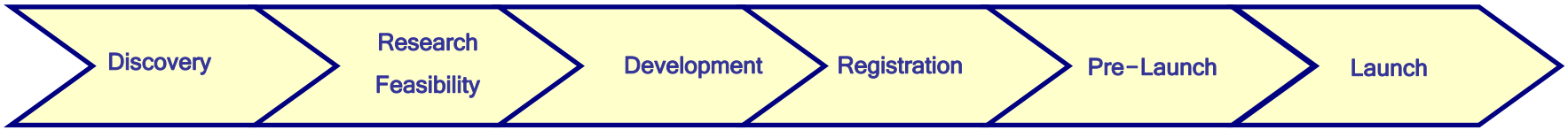


Pre- launch: Local confirmatory trials

Launch: Marketing support trials

Such efficacy trials with a newly developed feed additive will be usually conducted in collaboration with external R&D partners or potential customers.

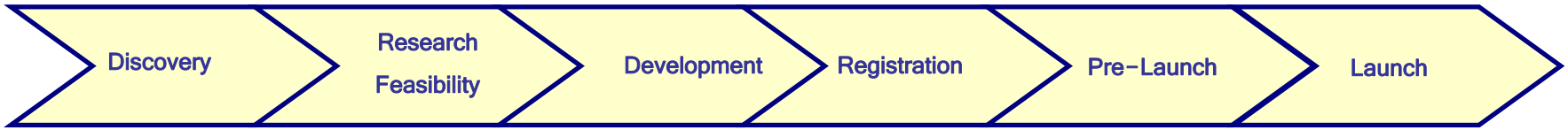
Development of a new feed additive: Time requirement (incl. EU approval)



Years

- Feed additive with a complete safety package 4 - 6
- Feed additive with a limited safety package (e.g. novel microbial phytase) 3 - 4
- Extension of application to other target species (approved feed additive) 1.5 - 3

Development of a new feed additive: Financial requirement



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- Feed additive with a complete safety package 3 - 4
- Feed additive with a limited safety package 2 - 3
  (e.g. novel microbial phytase)
- Extension of application to other target species 0.5 - 1
  (approved feed additive)

Development of a new feed additive: Importance of extramural research

- Involvement of extramural research partners in this process is very important during the research/ feasibility and development phases.

- Important tasks can be taken over by specialized contract institutes within the research phase, such as development of analytical methods, further confirmation of product efficacy in farm animals, examination of the mode of action etc.

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Development of a new feed additive: Importance of extramural research

- During the development phase, extensive toxicological testing and all the required efficacy and tolerance trials in target farm animals can be conducted only in close cooperation with external partners.

Conclusion:

To be successful in its efforts to develop and register new feed additives, industrial R&D has to rely on effective cooperation with a network of extramural research partners.