Antibiotic and synthetic growth promoters in animal diets

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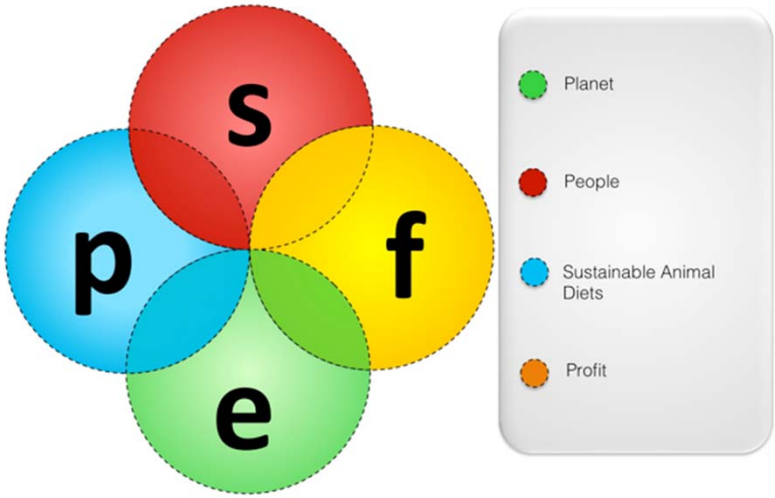
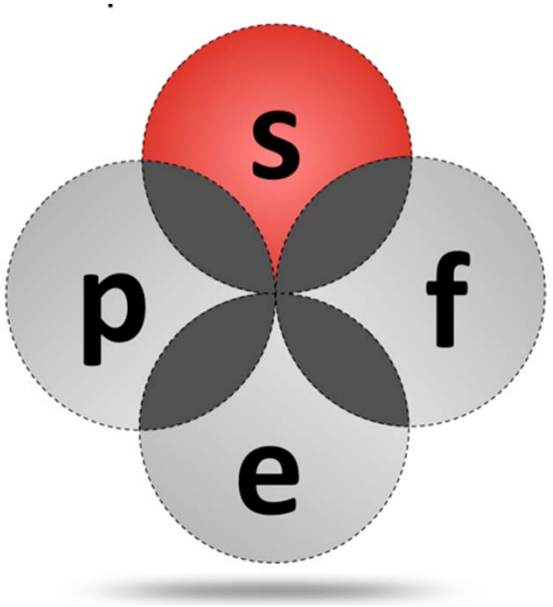
Abstract no. 23265

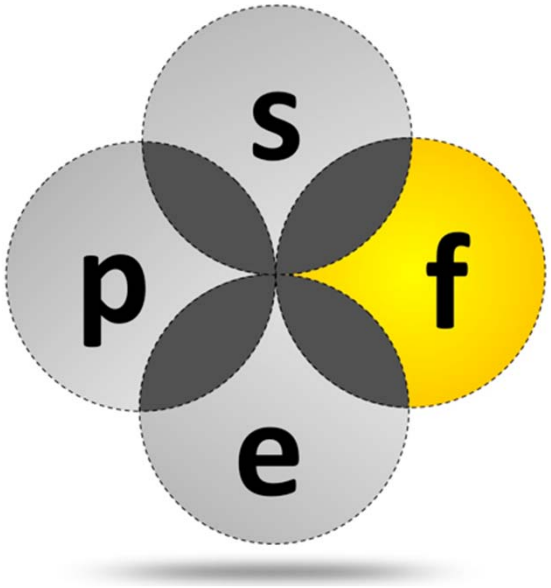
SUSTAINABLE ANIMAL DIETS” (**STAND)** CONCEPT WAS DEVELOPED BY THE FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO)





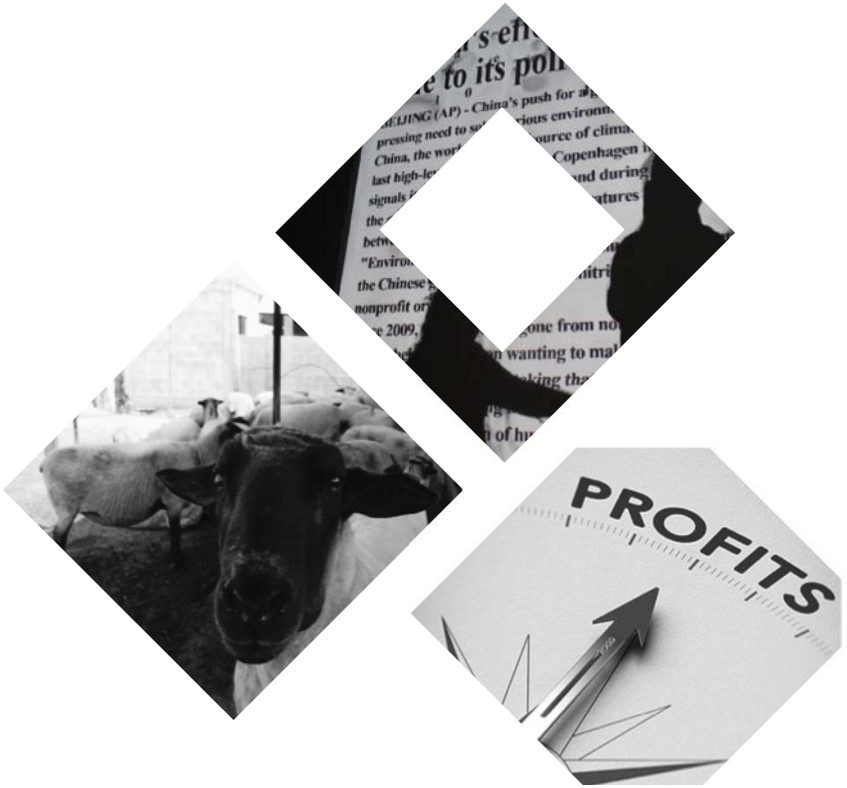
PEOPLE

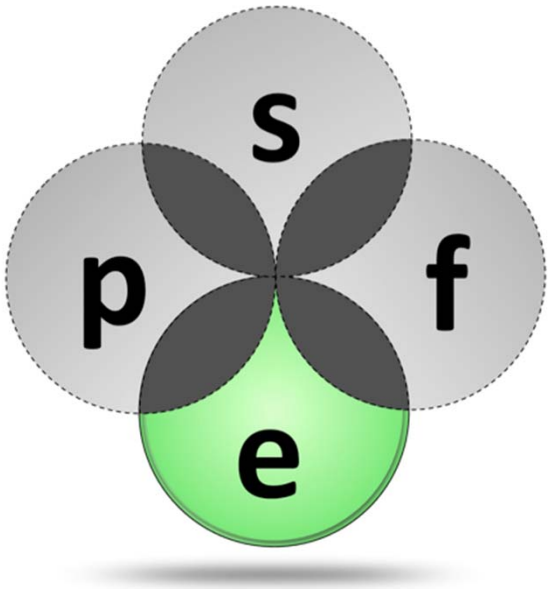
- Respect Ethical notions
- Meet Socio-cultural requirements
- Improve Human development



PROFIT

- Improve economic efficiency
- Improve economic viability
- Economic Independence





PLANET

- Minimize Environmental Pollution
- Conservation of non renewable resources
- Protection of Land and Biodiversity

People dimension

S.1.Respect Ethical notions	1	StAnD should not compete with human food
	2	StAnD should Reduce use food grains in ruminant diets *
	3	StAnD should Reduce use food grains in Monogastric diets *
	4	StAnD should Promote Animal welfare *
	5	StAnD should Not use antibiotic or synthetic growth promoters
S.2.Meet Socio-cultural requirements	6	StAnD should Not use Genetic Modified Organisms in crops *
	7	StAnD should Avoid exacerbation of unfavorable legal processes
	8	StAnD should Promote and preserve local knowledge
	9	StAnD should Respect perceptions, beliefs, values
	10	StAnD should Consider social aspects of rearing livestock
	11	StAnD should Not be cultural offensive to producers and consumers
S.3.Improve Human development	12	StAnD should Empower women
	13	StAnD should Break social barriers and promote social harmony

MATERIAL AND METHODS

Data base:

Was created from experiments where veterinary antibiotics (VAs=) and synthetic growth promoters (SGPs) were specified.

Using the data bases Scopus and Web of Science.

VETERINARY DRUGS AND SUBSTANCES WITH ANABOLIC EFFECTS

Group A

Contains substances that have anabolic effects: stilbenes (diethylstilbestrol), steroids, androgens (trenbolone acetate), gestagens (melengestrol acetate), estrogens (17-b estradiol), resorcylic acid lactones (zeranol), Beta-agonists (clenbuterol) and nitrofurans

Group B

Contains all the veterinary drugs in use, antibacterial substances, including sulfonamides and quinolones

Council Directive 96/23/EC, Annex 1 (European Commission, 1996)

FIGURE 1. TIMELINE OF ANTIBIOTIC GROWTH PROMOTERS (AGP)

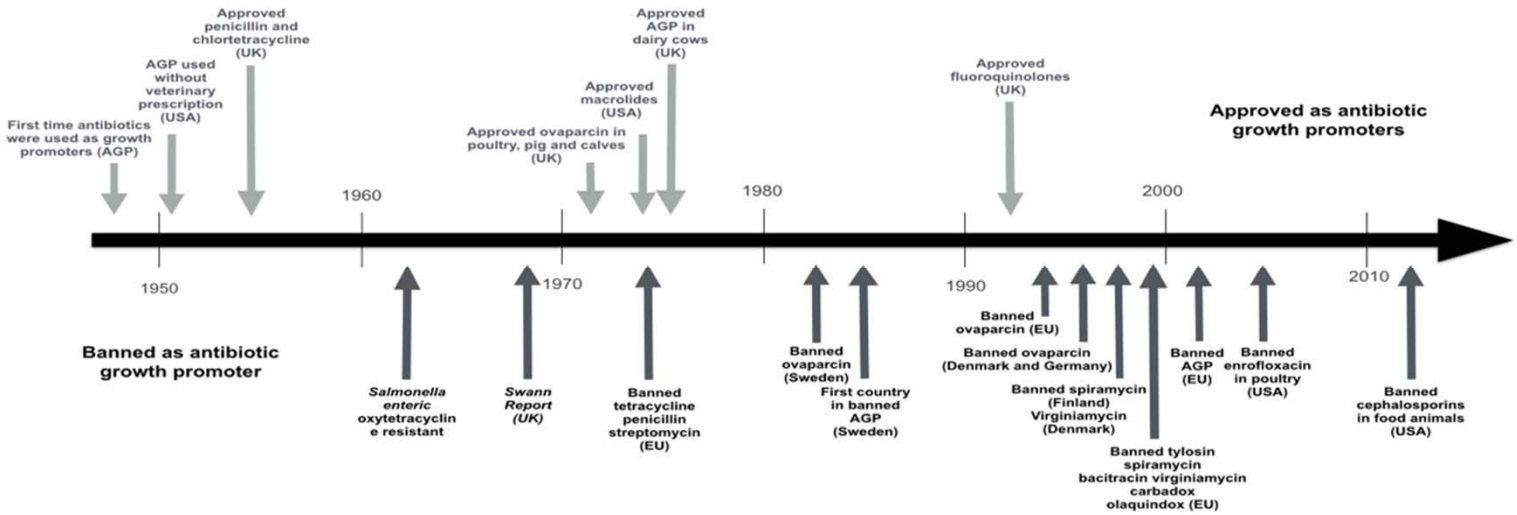


FIGURE 2. TIMELINE OF ANABOLIC GROWTH PROMOTERS

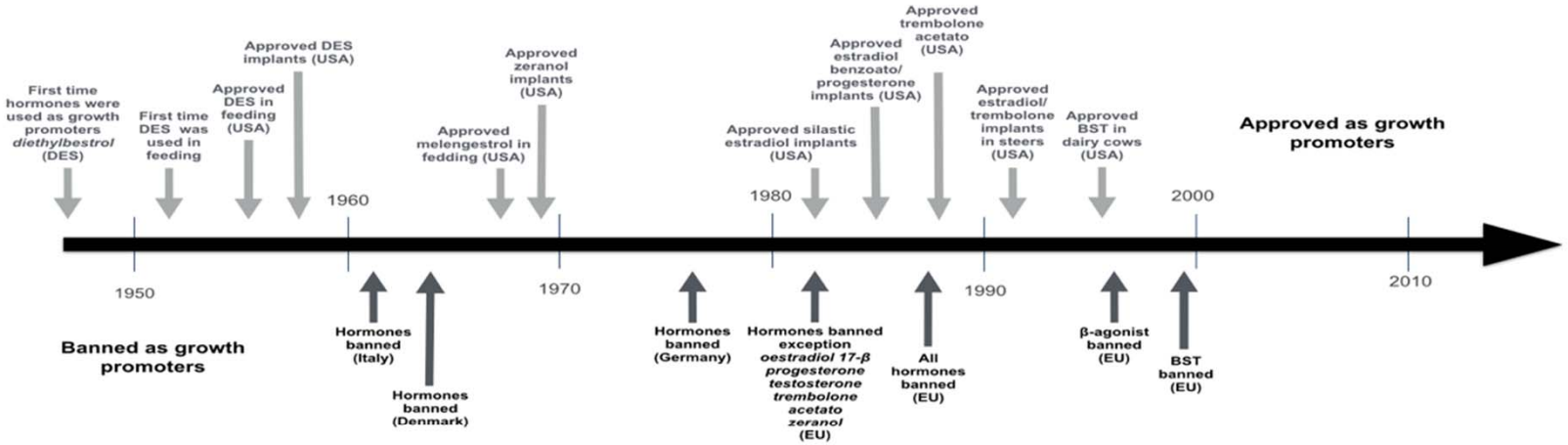
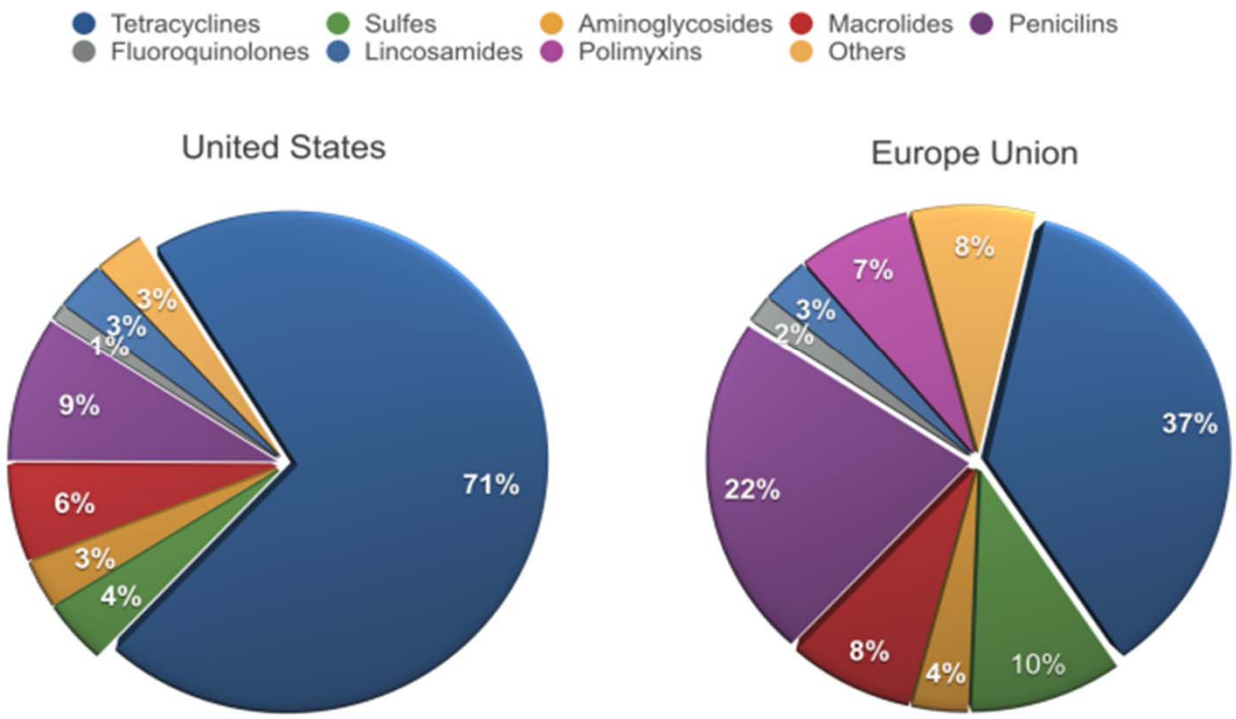


FIGURE 3. ANTIMICROBIALS USED IN FOOD PRODUCING ANIMALS IN THE UNITED STATES AND EUROPE UNION



Maximum residue limits (MRLs) of antimicrobials and anabolic in foodstuffs of animal origin: Antibiotics

Substance	Chemical group	Animal species	Matrix	MRLs (µg/kg)	Reference
Amoxicillin	β-lactam	All food producing species	Muscle, Fat, Liver Kidney	50	Commission Regulation (EEC) No 37/2010 of December 2009 (Official Journal of the European Union, L15/1, 20/1/2010)
Ampicillin	β-lactam	All food producing species	Muscle, Fat, Liver Kidney	50	Commission Regulation (EEC) No 37/2010 of December 2009 (Official Journal of the European Union, L15/1, 20/1/2010)
Chlortetracycline	Tetracyclines	All food producing species	Muscle Liver Kidney Milk Eggs	100 300 600 100 200	Commission Regulation (EEC) No 37/2010 of December 2009 (Official Journal of the European Union, L15/1, 20/1/2010)
Oxitetracycline	Tetracyclines	All food producing species	Muscle Liver Kidney Milk Eggs	100 300 600 100 200	Commission Regulation (EEC) No 37/2010 of December 2009 (Official Journal of the European Union, L15/1, 20/1/2010)

Maximum residue limits (MRLs) of antimicrobials and anabolic in foodstuffs of animal origin:Antibiotics

Substance	Chemical group	Animal species	Matrix	MRLs (µg/kg)	Reference
Tylosin	Macrolides	All food producing species	Muscle Fat Liver Kidney Milk Eggs	100 100 100 100 50 200	Commission Regulation (EEC) No 37/2010 of December 2009 (Official Journal of the European Union, L15/1, 20/1/2010)
Sulfonamide	Sulfonamide	All food producing species	Muscle Fat, Liver Kidney	100	Commission Regulation (EEC) No 37/2010 of December 2009 (Official Journal of the European Union, L15/1, 20/1/2010)

Maximum residue limits (MRLs) of antimicrobials and anabolic in foodstuffs of animal origin: Anabolics

Substance	Chemical group	Animal species	Matrix	MRLs (µg/kg)	Reference
17 β-estradiol	Natural steroids	-	-	UN	Joint FAO/WHO Expert Committee on Food Additives (JECFA). WHO food additives series, 2000.
Progesterone	Natural steroids	-	-	UN	Joint FAO/WHO Expert Committee on Food Additives (JECFA). WHO food additives series, 2000.
Zeranol	Xenobiotics	-	Muscle Liver	2 10	Joint FAO/WHO Expert Committee on Food Additives (JECFA). WHO food additives series, 1988.
Trembolone acetate	Xenobiotics	-	Muscle Liver	2 10	Joint FAO/WHO Expert Committee on Food Additives (JECFA). WHO food additives series, 1988.
Melengestrol acetate	Synthetic steroids	-	Muscle Liver Kidney Fat	1 10 2 18	Joint FAO/WHO Expert Committee on Food Additives (JECFA). WHO food additives series, 2006.

Common classes of veterinary drug residues and analytical techniques from food and feed in livestock

Term	Analytical method	Compound	References
Antibiotic	LC-MS GC-MS	Tetracycline, oxytetracycline, chlortetracycline, sulfamethazine, sulfamethoxazole, and sulfadimethoxine	Ahmed et al. 2015; Le Bizec et al. 2009; Baer et al., 2010
Antibiotic	LC-MS	Ampicillin, penicillin G, tetracycline, oxytetracycline, chlortetracycline, bacitracin A, virginiamycin M1, chloramphenicol, erythromycin A, clarithromycin, tylosin A, monensin A and streptomycin.	DeAlwis and Heller, 2010

Common classes of veterinary drug residues and analytical techniques from food and feed in livestock.

Term	Analytical method	Compound	References
Steroidal hormones	Grains / enzyme-linked immunosorbent assay (ELISA), LC-UV-EC	Zeranol	Hsieh et al., 2012
B-agonist and antibiotics	LC-MS/MS	20 veterinary drugs	Zhang et al., 2013

Conclussion

The monitoring program put in place to educate the population on the hazards of residues in animal products is necessary, in conjunction with a continuous decrease in the use of antibiotics and synthetic growth promoters in animal diets.

Thank you

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