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DEGLI STUDI
DI PADOVA

DAFNAE

Dipartimento di Agronomia Animali
Alimenti Risorse naturali e Ambiente

Progetto: Antibiotic Free Beef

Prof Massimo De Marchi



PATROCINIO
REGIONE DEL VENETO

BOVINO DA CARNE: ALLEVARE IN SALUTE

Venerdì 20 ottobre 2017 - ore 10.30
Crowne Plaza in Via Po, 197 - Padova





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ANTIBIOTICO RESISTENZA (AR)

“è un fenomeno per il quale un batterio risulta resistente all'attività di un farmaco antimicrobico” Weese et al. (2015) - J Vet Intern Med 49:29:487



“è un fenomeno per il quale un batterio risulta resistente all'attività di un farmaco antimicrobico” Weese et al. (2015) - J Vet Intern Med 49:29:487

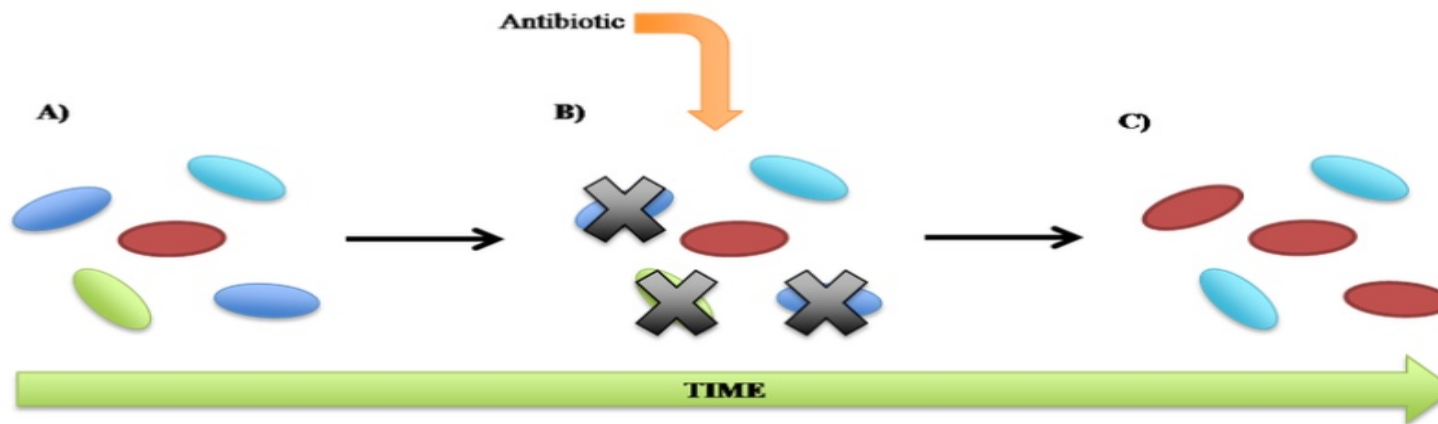


Figure 2.2. Selective pressure and antibiotic resistance development. (A) Bacterial population consists of a mixture of susceptible and resistant bacteria; (B) Antibiotics provide selective pressure, eliminating susceptible bacteria whilst resistant bacteria survive; (C) Resistant bacteria predominate the population. Figure adapted from Centers for Disease Control and Prevention (2013) and Rosenblatt-Farrell (2009).



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ANTIBIOTICO RESISTENZA (AR)

Antibiotici somministrati
agli animali e all'uomo



Figure 1.1. Potential routes of transmission of antibiotic resistant bacteria to humans. Figure adapted from Centers for Disease Control and Prevention (2013).

Alicia Grace Beukers 2016. Examining antibiotic resistance in the feedlot cattle industry using real-time, quantitative PCR (qPCR) and enterococci as an indicator bacterium. PhD thesis. Faculty of Veterinary Science The University of Sydney



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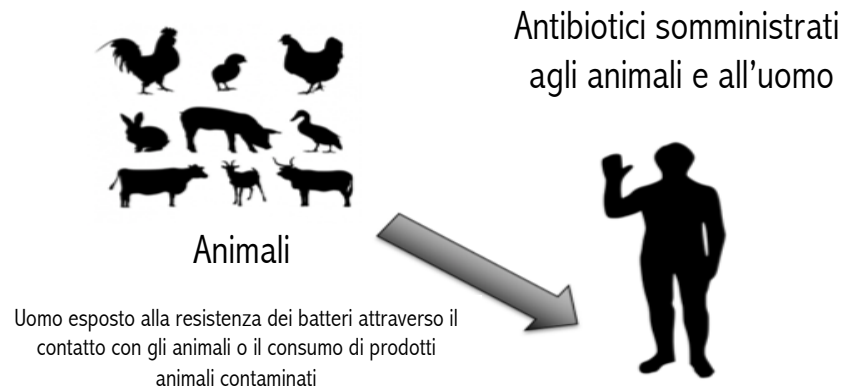


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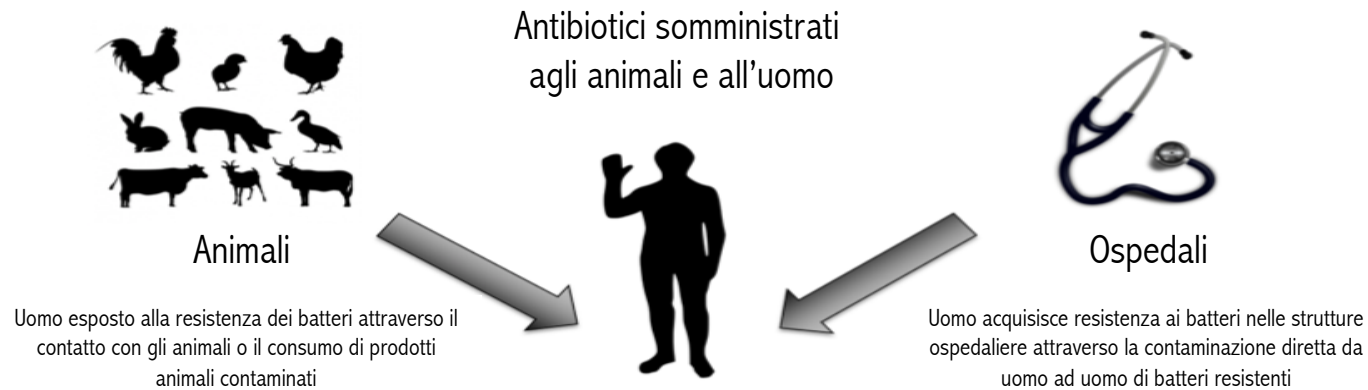


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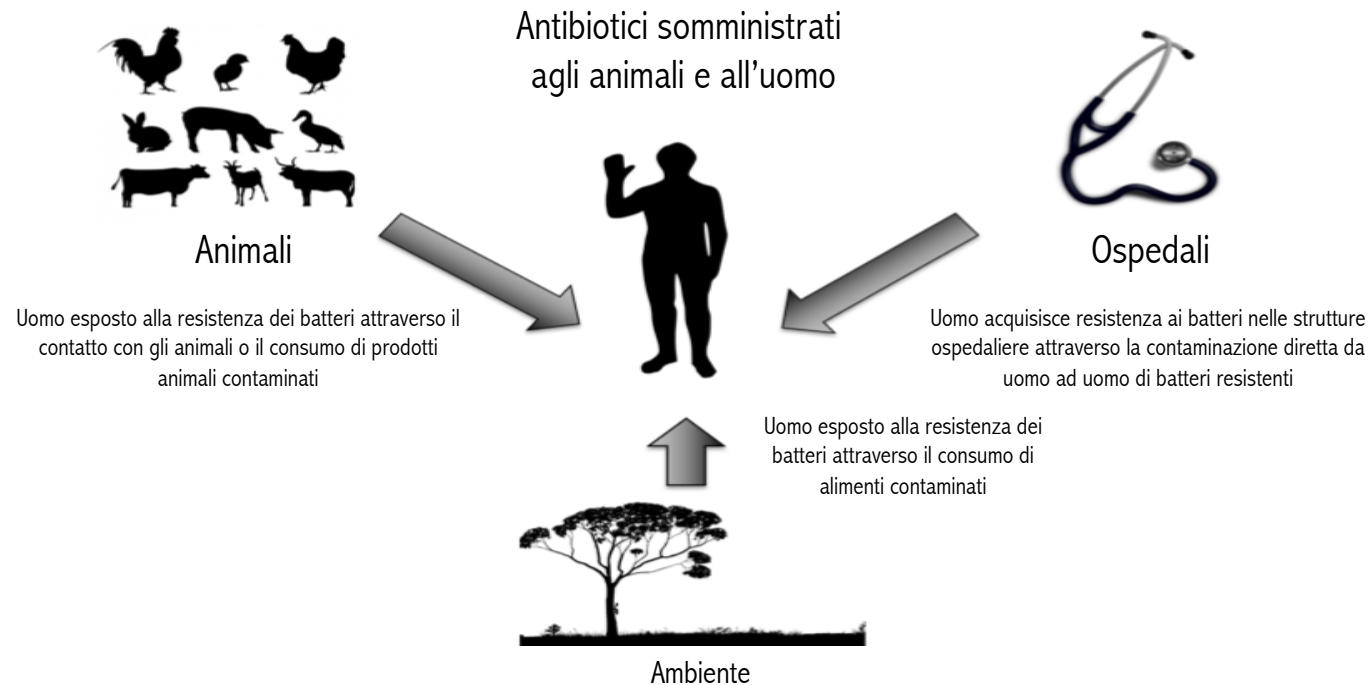


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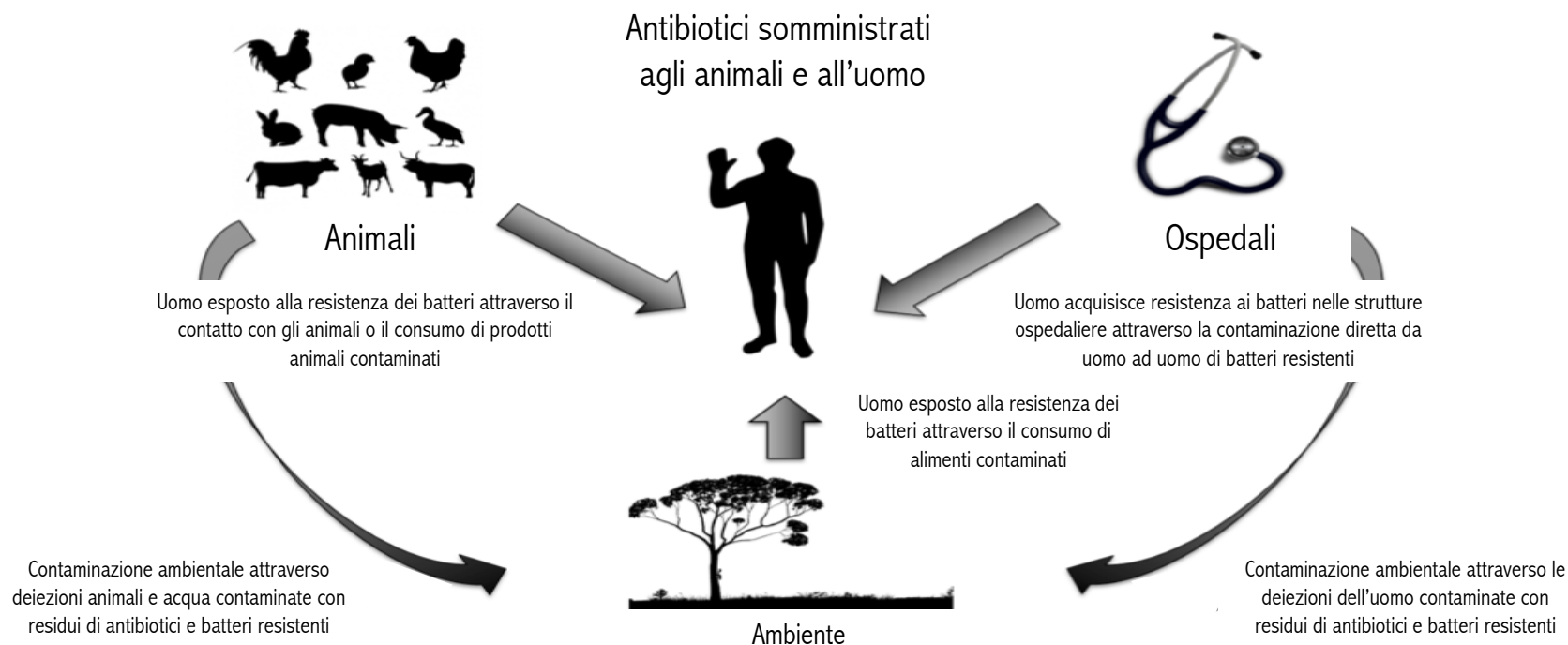


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ANTIBIOTICO RESISTENZA (AR)

“è un fenomeno presente da sempre ...”

**Antibiotic-resistant bacteria
found in 4-million-year-old
cave**





“è un fenomeno presente da sempre ...”

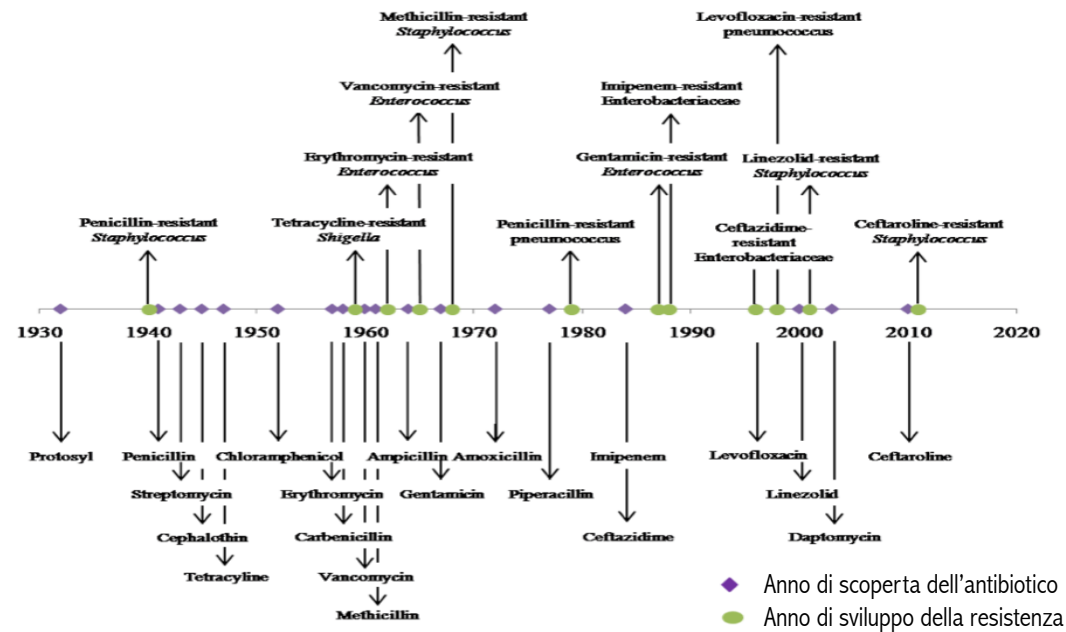


Figure 2.1. Timeline of antibiotic discovery and development of antibiotic resistance. Figure adapted from Centers for Disease Control and Prevention (2013); Zaffiri et al. (2012) and Zaffiri et al. (2013).

Alicia Grace Beukers 2016. Examining antibiotic resistance in the feedlot cattle industry using real-time, quantitative PCR (qPCR) and enterococci as an indicator bacterium. PhD thesis. Faculty of Veterinary Science The University of Sydney



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EUROPEAN MEDICINES AGENCY
SCIENCE MEDICINES HEALTH

Sales of veterinary antimicrobial agents in 29 European countries in 2014

Trends from 2011 to 2014
Sixth ESVAC report



2.5.1. Distribution of sales of antimicrobials for food-producing animals by country

Figure 21. Spatial distribution of overall sales of all antimicrobials for food-producing animals, in mg/PCU, for 29 countries, for 2014





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2.5.1. Distribution of sales of antimicrobials for food-producing animals by country

Figure 21. Spatial distribution of sales of antimicrobials for food-producing animals for 29 countries, for 2011 to 2014

Table 8. Annual sales of veterinary antimicrobial agents for food-producing species, in mg/PCU, for 29 European countries¹, from 2011 to 2014

Country	2011	2012	2013	2014	2014	Trends 2011-2014
Austria	54.5	54.9	57.2	56.3	57.2	54.5
Belgium	175.3	163.1	156.6	158.3	175.2	175.2
Bulgaria ²	92.6	98.9	116.1	82.9	116.6	116.1
Croatia				147.2	82.9	82.9
Cyprus	407.6	396.5	425.8	391.5	425.8	425.8
Czech Republic ³	83.0	79.8	82.2	79.5	391.5	391.5
Denmark	42.6	44.1	44.9	44.2	83.0	83.0
Estonia	66.0	56.1	62.2	68.0	79.5	79.5
Finland	21.9	21.8	22.4	22.3	68.0	68.0
France	116.5	102.7	95.0	107.0	56.1	56.1
Germany	211.5	204.8	179.7	149.3	218	218
Hungary	192.5	245.8	230.7	193.1	116.5	116.5
Iceland	6.6	5.9	5.3	5.2	95.0	95.0
Ireland	49.5	58.2	56.6	48.0	149.3	149.3
Italy	371.0	341.0	301.6	359.9	192.5	192.5

EUROPEAN
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Sales of antimicrobials in 29 countries

Trends in Sixth

mg/PCU
3.12
418.80
No data available



ANTIBIOTICO RESISTENZA (AR)

2.5.1. Distribution of sales

Figure 21. Spatial distribution of sales for 29 countries, for 2016

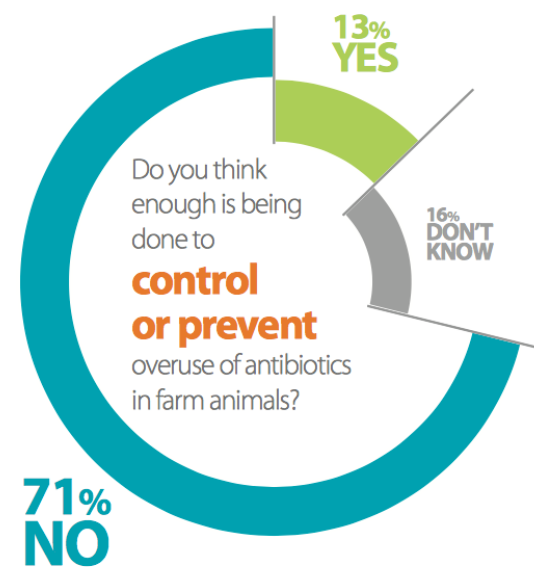
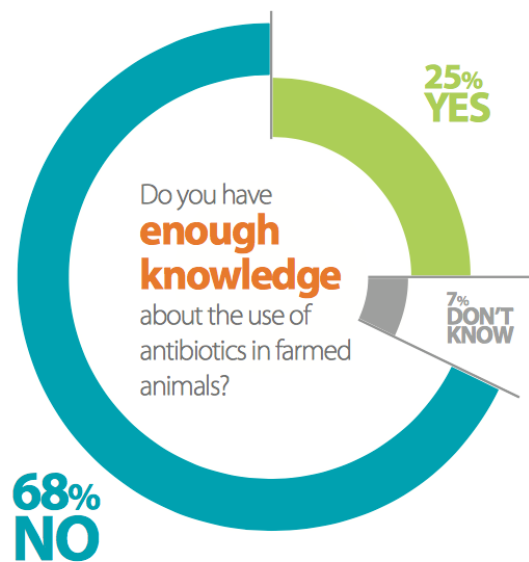
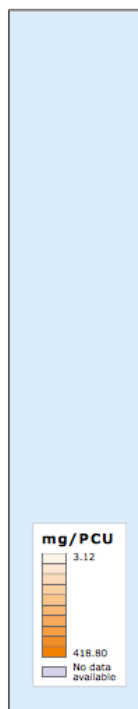
Table 8. Annual sales in 29 countries¹, from 2010 to 2016

Country
Austria
Belgium
Bulgaria ²
Croatia
Cyprus
Czech Republic ³
Denmark
Estonia
Finland
France
Germany
Hungary
Iceland
Ireland
Italy

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Sales of antibiotics in 29 countries

Trends in Sixth



Read the full report to find out more: www.efsa.europa.eu/en/supporting/pub/1183e



Eliminare l'utilizzo degli antibiotici ?

- a. Letteratura scientifica mostra risultati controversi
 - Volkova et al. (2016) – Riduzione antibiotici → Riduzione AR
 - Kassem et al. (2017); Agga et al. (2016) – Eliminazione antibiotici → non riduzione AR
 - Noyes et al. (2015); Smith et al. (2016) – Utilizzo antibiotici → a volte non AR
- b. Utilizzo antibiotici per gli animali veramente ammalati (contaminazione con altri animali → aumento utilizzo antibiotici)
- c. Ruolo fondamentale dei tecnici veterinari (conferma diagnosi; modalità dei trattamenti; prevenzione; ...)



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Nebraska College of Engineering USDA funds antibiotic resistance research

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USDA funds antibiotic resistance research

Aug 24, 2017 By Keith McGuffey RSS

Antibiotic use on farms helps to treat illnesses in livestock, reducing mortality rates and keeping livestock healthy. However, there is a growing concern that the use of antibiotics produces resistant bacteria. Dr. Xu Li, an associate professor in the University of Nebraska Department of Civil Engineering, is leading a team of researchers to develop manure management strategies to mitigate the risk of antibiotic resistance associated with livestock manure.

The four year, \$1.2 million project is a part of the United States Department of Agriculture's Agriculture and Food Research Initiative. It addresses the USDA's Food Safety challenge area, which works to reduce foodborne illnesses and deaths by improving the safety of the food supply. The research team will be looking specifically at antibiotic resistance genes in manure as they move through the beef cattle manure management system.



Cattle at the ARDC feedlot



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Kansas Agricultural Experiment Station Research Reports

Volume 3

Issue 1 *Cattlemen's Day*

Article 7

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January 2017

Producer Opinions on Antibiotic Use in the Beef Industry

T. Lee

Kansas State University, Manhattan, tlee@vet.k-state.edu

C. D. Reinhardt

Kansas State University, Manhattan, cdr3@k-state.edu

E. F. Schwandt

Kansas State University, Manhattan, eschwandt@k-state.edu

D. U. Thomson

Kansas State University, Manhattan, dthomson@vet.k-state.edu



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SCIENTIFIC AMERICAN.

English ▾ Cart **0** Shopping reports

Antibiotic-resistant bacteria from livestock pose a deadly risk to people. But the farm lobby won't let scientists track the danger

By Melinda Wenner Moyer on December 1, 2016



Credit: Patrick Cavan Brown

IN BRIEF

- Antibiotics are used more heavily in farm animals than in people. This may be the largest source of antibiotic-resistant bacteria.
- Drug-resistance genes spread more widely and rapidly on farms than scientists ever thought, new discoveries show.
- The agriculture industry says fears are exaggerated, whereas researchers say companies are endangering public health.

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The Enemy Pattern of Ai Resistance



Curb Antibic Animals



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Irish Farmers Journal / **Antimicrobial resistance**

Antimicrobial resistance

MEMBER

Irish antibiotic use falling

New European report show Ireland well placed to tackle rising antimicrobial resistance issue.

By **Thomas Hubert** on 10 August 2017

MEMBER

Turning the AMR threat into an opportunity

Education at farm level will also be key, with the potential to tackle many of the animal health challenges on farms through better management and shed design.

By **Justin McCarthy** on 10 August 2017

MEMBER

More e-monitoring of animals and medicines on the cards

Antibiotic usage should be monitored electronically and e-tagging of cattle and sheep are considered under the new animal health strategy.

By **Thomas Hubert** on 13 July 2017

MEMBER

Italian buyer wants more weanlings and beef

In a boost for farmers, Coop Italia wants antibiotic-free cattle and beef from Ireland.

By **Paul Mooney** on 06 July 2017

MEMBER

Ireland can benefit from growing demand for antibiotic-free beef

A more proactive approach towards herd health is needed to ensure we keep ahead of this trend.

By **Justin McCarthy** on 06 July 2017

MEMBER

Tackling the rising threat of antimicrobial resistance

If not addressed, antimicrobial resistance is forecast to potentially cause more deaths than cancer by 2050.



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Irish Farmers Journal / News / News / Italian buyer wants more weanlings and beef

Italian buyer wants more weanlings and beef

By Paul Mooney on 06 July 2017

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In a boost for farmers, Coop Italia wants antibiotic-free cattle and beef from Ireland.



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By Paul Mooney on 0

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farm antibiotics

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ANTIBIOTIC GUARDIAN

Essential Reading: New European report shows UK farming on right track to reduce antimicrobial resistance

Antibiotic Guardian

The concept behind Antibiotic Guardian is simple – it invites the public, students and educators, farmers, the veterinary and medical communities and professional organisations, to become Antibiotic Guardians. Launched by Public Health England in 2015, has now has almost 50,000 pledges including a number from farmers and farm vets.

Its aim is to promote a 'One Health' approach to antibiotic stewardship – a concept best summarised in the [UK Government's 2015 One Health report](#): "Resistant bacteria from animals and humans can transmit in both directions, through human contact with farm, wildlife or companion animals or their environments, through ingestion of contaminated food (both imported and local produced animal and vegetable or fruit items) and through contact with effluent waste from humans, animals and industry. Thus an integrated – One Health – approach to surveillance and action is needed."

The Antibiotic Guardian pledges for farmers can currently be found under 'Member of the Public', and for vets, under 'Healthcare Professional or Leader'. However, we hope the categories for food and farming will be updated and expanded in 2017 so watch this space! In the meantime, visit www.antibioticguardian.com for more information.

IDEAS HUB

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Antibiotic Guardian

In a boost for farmers, Coop Italia wants antibiotic-free cattle and beef from Ireland.



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By Paul Mooney on C

farm antibiotics

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Essential Reading: Resistant bacteria four million years old are shedding new l-

Essential Reading: New Eur

Antibiotic Guard

The concept behind Antibiotic G
veterinary and medical commun
Launched by Public Health Eng
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Its aim is to promote a 'One Hea
UK Government's 2015 One Hea
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The Antibiotic Guardian pledges
vets, under 'Healthcare Professi
be updated and expanded in 20
for more information.

In a boost for farmers, Coop Italia wants antibiotic-free cattle and beef from Ireland.

Progress by Sector: Beef Cattle

Snapshot

- The beef sector has been working to identify and agree meaningful objectives for reducing, replacing or refining antibiotic use.
- These targets will be published, alongside those for the other key farming sectors, at the RUMA conference on 27 October (see [Events](#) page).
- The beef sector is overall considered a lower user of antibiotics, but is nonetheless committed to further improving stewardship.
- For case studies, inspiration and technical tools to help farmers and vets reduce, replace or refine antibiotic use, visit the [Ideas Hub](#).

News Updates

New Red Tractor antibiotic rules outlined
26 Jul 2017

RUMA response to new Soil Association campaign

PROGRESS BY SECTOR

- Beef Cattle
- Dairy Cattle
- Egg Production
- Fish Production
- Game Bird Rearing
- Pig Production
- Poultry Meat Production
- Sheep & Lamb Production
- Vet, Med & Regulatory



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PROGETTO ANTIBIOTIC FREEBEEF — Descrizione Generale

Titolo: Strategie per l'eliminazione dell'utilizzo degli antibiotici nell'allevamento del bovino da carne

Partners:

- a. Azove Soc. Agr. Coop.
- b. Azove Carni S.r.l.
- c. Università degli Studi di Padova - DAFNAE
- d. Istituto Zooprofilattico Sperimentale delle Venezie
- e. Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna
- f. Istituto regionale per l'educazione e gli studi cooperativi - Irecoop Veneto

Misure: PSR 16.1.1; 16.1.2; 1.1.1



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PROGETTO ANTIBIOTIC FREE BEEF

SCHEMATIZZAZIONE PROGETTO - AntibioticFreeBeef

Misura 1.1.1	Misura 16.2.1		Misura 16.1.1	
FORMAZIONE Allevatori	INDAGINE UTILIZZO ANTIBIOTICO	SPERIMENTAZIONE IN CAMPO	Gestione GO e trasferimento Conoscenza PAGO	
	WP 1 VENETO	WP 2 FRANCIA		WP 3 Identificazione: Benessere, Tecniche di quarantena e condizionamento, Dieta Innovativa
	WP 4 PROVE SPERIMENTALI IN ALLEVAMENTO			
	WP 5 Analisi Dati e Interpretazione dei Risultati	WP 6 Stesura Disciplinare di Produzione Carne Antibiotic-Free e Collaudo negli Allevamenti		
BOVINO DA CARNE - Antibiotic-Free				



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PROGETTO ANTIBIOTIC FREEBEEF - Obiettivi

Obiettivo 1 - Identificare **strategie** per l'eliminazione dell'utilizzo di antibiotici nell'allevamento intensivo del bovino da carne

Obiettivo 2 - **Aumentare la redditività degli allevatori** attraverso la riduzione dei costi diretti e indiretti legati all'impiego di antibiotici e la realizzazione di una nuova tipologia di prodotto ("antibiotic-free")

Obiettivo 3 - **Accrescere la sensibilità** da parte degli allevatori circa l'impatto derivante dall'utilizzo di antibiotici nell'allevamento del bovino da carne, nell'ottica di una gestione maggiormente responsabile e socialmente sostenibile

Obiettivo 4 - **Migliorare la qualità e la sostenibilità della carne bovina**, al fine di soddisfare le esigenze del consumatore



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PROGETTO ANTIBIOTIC FREEBEEF - WP

WP 1 - Indagine di campo circa l'attuale utilizzo degli antibiotici negli allevamenti di bovini da carne ristallati in Veneto

almeno 1.000 partite e 60.000 capi ristallati



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PROGETTO ANTIBIOTIC FREEBEEF - WP

WP 1 - Indagine di campo circa l'attuale utilizzo degli antibiotici negli allevamenti di bovini da carne ristallati in Veneto

WP 2 - Indagine circa l'attuale utilizzo degli antibiotici su bovini da carne in Francia

WP 3 - Individuazione (i) delle **migliori pratiche di miglioramento del benessere e di gestione della quarantena e del condizionamento**, e (ii) della **dieta innovativa** da testare nelle prove sperimentali



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PROGETTO ANTIBIOTIC FREEBEEF - WP

WP 1 - Indagine di campo circa l'attuale utilizzo degli antibiotici negli allevamenti di bovini da carne ristallati in Veneto

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WP 3 - Individuazione (i) delle **migliori pratiche di miglioramento del benessere e di gestione della quarantena e del condizionamento**, e (ii) della **dieta innovativa** da testare nelle prove sperimentali

WP 4 - Prove sperimentali in allevamento

almeno 1.200 vitelloni ristalli

tecniche di gestione: Quarantena & Condizionamento vs. Condizionamento

tipologie di razione: Tradizionale vs. Innovativa (dieta arricchita di integratori/additivi alimentari)



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PROGETTO ANTIBIOTIC FREEBEEF - WP

WP 1 - Indagine di campo circa l'attuale utilizzo degli antibiotici negli allevamenti di bovini da carne ristallati in Veneto

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WP 4 - Prove sperimentali in allevamento

WP 5 - Analisi dati, studio e identificazione delle tecniche di miglioramento delle condizioni di salute, benessere e biosicurezza, prevenzione e profilassi, gestione e razionamento degli animali



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WP 1 - Indagine di campo circa l'attuale utilizzo degli antibiotici negli allevamenti di bovini da carne ristallati in Veneto

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WP 3 - Individuazione (i) delle migliori pratiche di miglioramento del benessere e di gestione della quarantena e del condizionamento, e (ii) della dieta innovativa da testare nelle prove sperimentali

WP 4 - Prove sperimentali in allevamento

WP 5 - Analisi dati, studio e identificazione delle tecniche di miglioramento delle condizioni di salute, benessere e biosicurezza, prevenzione e profilassi, gestione e razionamento degli animali

WP 6 - Stesura del disciplinare di produzione del bovino da carne “antibiotic-free” e collaudo del medesimo in condizioni di campo



Riduzione dell'utilizzo degli antibiotici:

- a. importanza etica e sociale
- b. strumento per il miglioramento della redditività dell'allevamento

Ricerca tecnico-scientifica:

- a. monitoraggio e prove sperimentali
- b. approccio multidisciplinare

Formazione:

- a. tecnici
- b. veterinari
- c. allevatori
- d. consumatori

DAFNAE

Improving knowledge



**DIPARTIMENTO DI AGRONOMIA
ANIMALI ALIMENTI
RISORSE NATURALI E AMBIENTE**

massimo.demarchi@unipd.it



Valutazione della Qualità della Ricerca

DAFNAE è al **1° posto in Italia** per qualità della ricerca scientifica nell'Area 7 - Scienze Agrarie e Veterinarie (VQR 2004-2010 e 2011-2014).



DAFNAE è stato inoltre annoverato tra i **Dipartimenti di Eccellenza** dal Ministero dell'Università e della Ricerca.



a) 2012-2015; Fonte: WoS/Scopus.