ALTERNATIVE PROTEIN SOURCES

BfR

WHAT DOES SCIENCE SAY?

THE BFR SCIENCE COMIC

INSECTS AREN'T EXACTLY A DELICACY IN EUROPE, BUT;

DID YOU KNOW THAT EATING THEM USED TO BE VERY COMMON IN GERMANY?

WHAT!?

+++ COCKCHAFER SOUP +++ WAS MAINLY SERVED IN THURINGIA, HANOVER AND HESSE.

I KNOW THAT SMELL...

ME TOO!

IN THE 19TH AND 20TH CENTURY THERE WERE SEVERAL COCKCHAFER PLAGUES AND IT WAS LUCRATIVE TO COLLECT THEM FOR FOOD.

STOP

TASTES LIKE CRAB SOUP...

NOPE, MUCH BETTER!

IN THE 1950'S, THE BEETLES WERE ALMOST COMPLETELY EXTINCT.

WHERE HAVE ALL THE COCK-CHAFERS GONE...

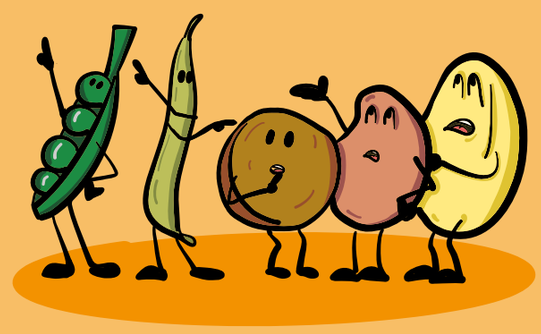
TODAY, EDIBLE INSECTS ARE CONSIDERED AN +++ ALTERNATIVE PROTEIN SOURCE. +++
BUT THAT CATEGORY ALSO INCLUDES ALL PROTEINS IN FOOD AND FEED THAT DON'T COME FROM MEAT, FISH, EGGS OR DAIRY.

IS THIS THE FUTURE OF FOOD NOW?

WHAT DOES SCIENCE SAY?

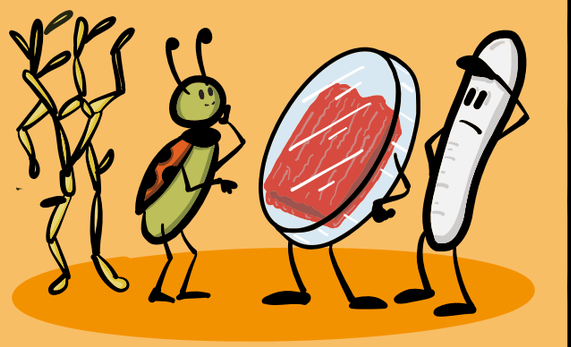
ALTERNATIVE PROTEIN SOURCES

COMMON ON THE E.U. MARKET



- PEAS
- BEANS
- LENTILS
- SOY
- LUPINS

NOT COMMON ON THE E.U. MARKET YET



- INSECTS
- CULTURED MEAT
- MYCOPROTEIN BIOMASS
- MICROORGANISMS

PROGNOSES POINT TO A GLOBAL PROTEIN DEFICIT IN THE SUPPLY OF THE WORLD'S GROWING POPULATION.

THIS COULD BE OFFSET BY ALTERNATIVE PROTEIN SOURCES.*

EXCUSE ME, DOCTOR!?

THE ECOLOGICAL FOOTPRINT OF SEVERAL ALTERNATIVE PROTEIN SOURCES SUCH AS INSECTS IS FAR SMALLER THAN FOR CATTLE OR PIGS.

THAT'S EXACTLY RIGHT! AND WHY? SHOOT!!!

OUR PLEASURE!

* SOURCE: BFR FAQ ALTERNATIVE PROTEIN SOURCES, (NOV. 2024), HTTPS://WWW.BFR.BUND.DE/EN/LUPINS___INSECTS_OR_LAB_GROWN_MEAT___WHAT_IS_THE_CURRENT_STATE_OF_HEALTH_RISK_ASSESSMENT_FOR_ALTERNATIVE_PROTEIN_SOURCES_-311953.HTML, (ZUGRIFF: 2/12/2024)

2050

GLOBAL PROTEIN DEMAND WILL INCREASE BY 75 % BY 2050.**

(-)

(-)

Alternative Protein Sources

LESS LAND AND WATER IS NEEDED FOR PRODUCTION AND THEY PRODUCE LESS GREENHOUSE GAS THAN CONVENTIONAL LIVESTOCK FARMING.

** SOURCE: REPORT FOR HIGH-LEVEL EXPERT FORUM „HOW TO FEED THE WORLD 2050", (OCT 2009), FOOD AND AGRICULTURE ORGANISATION OF THE UNITED NATIONS (FAO), HTTPS://WWW.FAO.ORG/FILEADMIN/TEMPLATES/WSFS/DOCS/ISSUES_PAPERS/HLEF2050_INVESTMENT.PDF, (ACCESS: 22/11/2024)

LEGUMES SUCH AS PEAS, BEANS, LENTILS AND SOY HAVE BEEN ESTABLISHED AS PLANT-BASED ALTERNATIVE PROTEIN SOURCES HERE FOR SOME TIME. NOW, THIS ALSO INCLUDES LUPINS...

MYCOPROTEINS FROM FUNGI ARE ALSO BEING USED IN PROCESSED MEAT SUBSTITUTES. IN ASIA AND AFRICA MICROALGAE ARE AN IMPORTANT SOURCE OF PROTEINS.

...WHICH HAVE THE HIGHEST PROTEIN CONTENT OF ALL DOMESTIC LEGUMES.

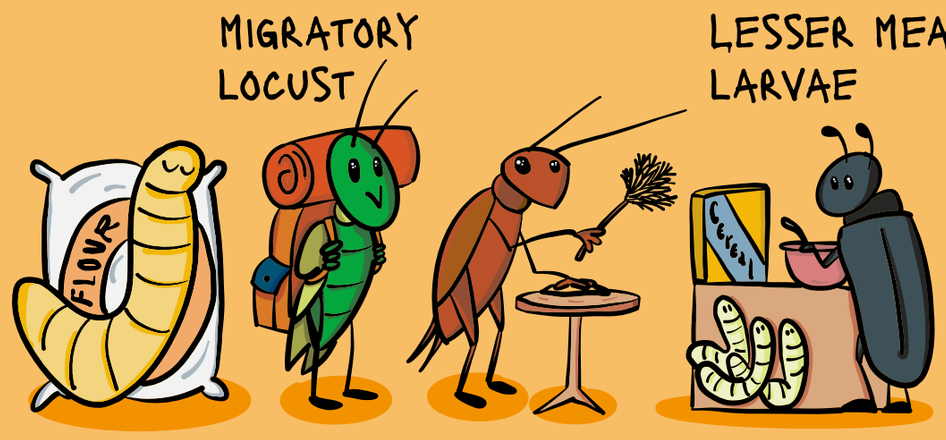
LUPINS

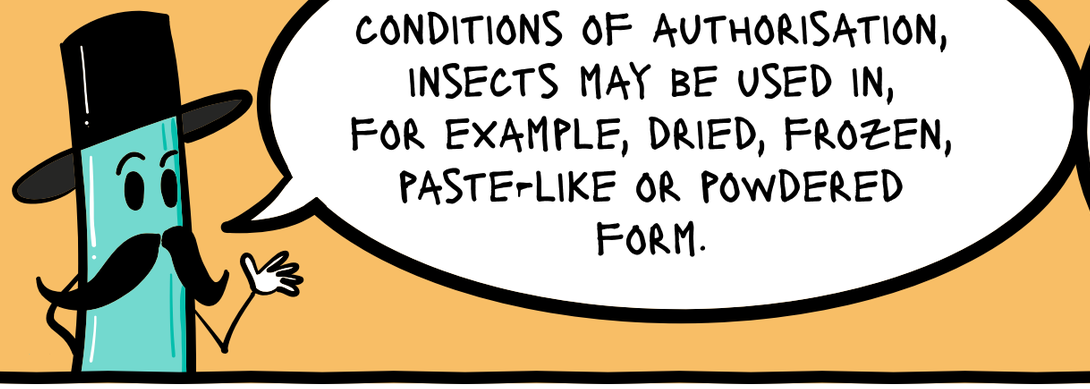
WOW! WHAT ABOUT INSECTS AND CULTURED MEAT?

+++ INSECTS +++

BUGS CONVERT THEIR FOOD VERY EFFICIENTLY INTO PROTEIN THAT IS VALUABLE TO HUMANS.

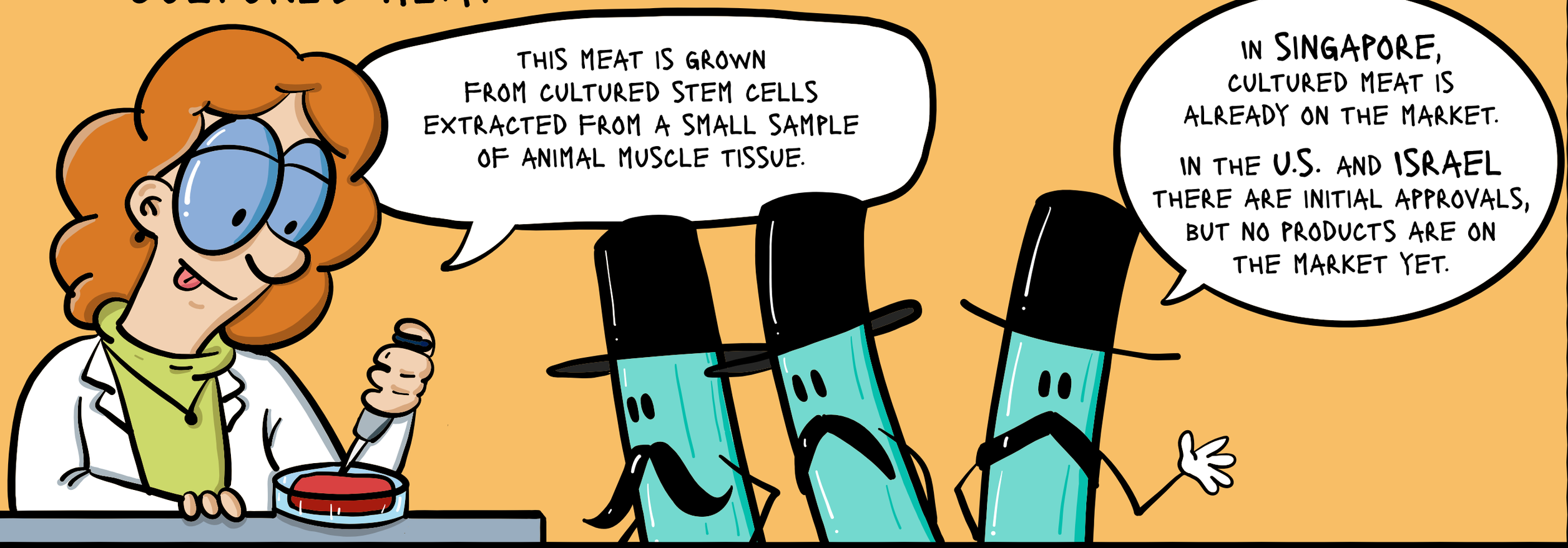
SO FAR, SEVERAL INSECT SPECIES HAVE BEEN APPROVED FOR FOOD PRODUCTION IN THE EU.





* SOURCE; 'WORM' UP TO THE IDEA OF EDIBLE INSECTS – FOUR REASONS WHY EDIBLE INSECTS ARE GOOD PROSPECTS FOR FOOD SECURITY AND LIVELIHOODS, FOOD AND AGRICULTURE ORGANISATION OF THE UNITED NATIONS (FAO), (SEP 2022), HTTPS://WWW.FAO.ORG/NEWSROOM/STORY/A-WORM-UP-TO-THE-IDEA-OF-EDIBLE-INSECTS/EN, (ACCESS; 22/11/2024)

+++ CULTURED MEAT +++



EATING BUGS, DUDE...

I WONDER WHAT **PEOPLE** THINK OF THIS.

THINK OF **WHAT?**

IN GERMANY, HAMBURGERS MADE FROM INSECT LARVAE AS WELL AS CRICKET PROTEIN BARS WERE OFFERED FOR SALE IN CERTAIN SUPERMARKETS FOR THE FIRST TIME IN 2018.***

*** SOURCE: INSEKTENBURGER, -PASTA & CO: WAS IST AUS DEM TREND MIT LARVEN UND GRILLEN GEWORDEN?, BUSINESSINSIDER.DE/GRÜNDERSZENE, (JUL 2021), HTTPS://WWW.BUSINESSINSIDER.DE/GRUENDERSZENE/FOOD/INSEKTEN-TREND-LEBENSMITTEL-2021-12/, (ACCESS: 22/11/2024)

EXCUSE ME, WHERE CAN I FIND THE INSECT BURGERS?

SORRY, THEY'VE ALL RUN OFF.

BUT;

PEOPLE IN GERMANY ARE OPEN TO PROTEIN SOURCES THAT AREN'T TRADITIONALLY MEAT-BASED.

WHICH FOOD CATEGORIES DO YOU TYPICALLY CONSUME ON A DAILY BASIS?**

	2016	2024
FRUITS & VEGETABLES	74%	71%
DAIRY PRODUCTS	59%	62%
MEAT & SAUSAGES	34%	23%
VEGAN + VEGETARIAN ALTERNATIVES TO ANIMAL PRODUCTS	--	10%
FISH & SEAFOOD	2%	1%

** SOURCE: SAMPLE: 1,001 REPRESENTATIVE GERMAN CITIZENS AGED 14 YEARS AND OLDER, FORSA NUTRITION REPORT 2024, ON BEHALF OF BMEL.

ALTHOUGH THE CONSUMPTION OF PLANT-BASED PROTEINS CONTINUES TO INCREASE, CONSUMERS IN EUROPE ARE +++ **SKEPTICAL** +++ OF EATING INSECTS.*

* SOURCE BFR FAQ ALTERNATIVE PROTEIN SOURCES, (NOV. 2024), HTTPS://WWW.BFR.BUND.DE/EN/LUPINS__INSECTS_OR_LAB_GROWN_MEAT__-_WHAT_IS_THE_CURRENT_STATE_OF_HEALTH_RISK_ASSESSMENT_FOR_ALTERNATIVE_PROTEIN_SOURCES_-317953.HTML, (ZUGRIFF: 2/12/2024)

+++ WHAT IS KNOWN ABOUT POTENTIAL HEALTH RISKS ASSOCIATED WITH ALTERNATIVE PROTEIN SOURCES? +++

ARE WE RELATED?

KAFKA VERWANDLUNG

ALLERGIC REACTIONS (CROSS REACTIVITY)

PEOPLE ALLERGIC TO CRUSTACEANS, DUST MITES AND MOLLUSCS MAY EXPERIENCE ALLERGIC REACTIONS TO INSECTS AS WELL, DUE TO THEIR VERY SIMILAR PROTEINS.

MICROBIOLOGICAL RISKS

NOVEL PROTEIN SOURCES MAY CONTAIN BACTERIA, VIRUSES OR...

LUPIN

...OTHER MICROBIOLOGICAL CONTAMNANTS.

INADEQUATE PROCESSING OR HYGIENE DEFICIENCIES CAN INCREASE THE RISK.

CONTAMINANTS

THEY CAN ACCUMULATE UNDESIRABLE SUBSTANCES SUCH AS HEAVY METALS, PESTICIDES, OR CHEMICALS, E.G. IF THEY COME FROM CONTAMINATED AREAS.

TOO MUCH HEAVY METAL!

UNKNOWN TOXINS

THIS APPLIES PARTICULARLY TO EXOTIC PLANTS OR NEWLY DISCOVERED MICROORGANISMS.

NAME?

I DON'T HAVE ONE YET!

PROCESSING

PROCESS CONTAMINANTS MAY BE FORMED DURING PRODUCTION.

THE BFR IS TASKED

WITH ASSESSING EXISTING HEALTH RISKS AND IDENTIFYING NEW ONES.

THIS ALSO INCLUDES DEVELOPING TESTS ON THE ALLERGENIC POTENTIAL OF ALTERNATIVE PROTEIN SOURCES.

MANY FOODS THAT CONSIST OF OR CONTAIN ALTERNATIVE PROTEINS BELONG TO THE FOOD GROUP KNOWN AS

+++ NOVEL FOOD. +++

IN EUROPE, THEY ARE ONLY APPROVED AFTER A COMPREHENSIVE HEALTH RISK ASSESSMENT.

PAPERS, PLEASE.

CRICKET FL

EU

NOVEL WHAT!?

IT'S FRENCH; NOUVELLE CUISINE!

Any food that was not consumed in the EU before May 1997 is considered a "novel food" and must be assessed.

INGREDIENTS

IN ADDITION TO FOODS WITH ALTERNATIVE PROTEIN SOURCES, PRODUCTS CONTAINING MAJOR ALLERGENS MUST ALSO BE LABELLED ACCORDINGLY.

FOR SOME NOVEL FOODS THE POTENTIAL TO INDUCE ALLERGIC REACTIONS IN CERTAIN INDIVIDUALS SHOULD BE TAKEN INTO ACCOUNT.

+++ NO ADVERSE HEALTH EFFECTS +++

ARE TO BE EXPECTED WHEN ENJOYING INSECTS THAT HAVE BEEN APPROVED IN THE EU.

MORE INFORMATION; WWW.BFR.BUND.DE

*SOURCE; DEEP SPACE FOOD CHALLENGE, NASA (AUG, 2024), HTTPS://WWW.NASA.GOV/NEWS-RELEASE/NASA-AWARDS-1-25-MILLION-TO-THREE-TEAMS-AT-DEEP-SPACE-FOOD-FINALE/, (ACCESS; 22/11/2024)

ALTERNATIVE PROTEIN SOURCES ARE EXPECTED TO PLAY AN IMPORTANT ROLE IN THE GLOBAL FOOD SUPPLY OF THE FUTURE.

PLUS, THEY ARE BEING CONSIDERED AS A FOOD FOR ASTRONAUTS ON SPACE MISSIONS.*

LIFE ON MARS?

LUCY IN THE SKY WITH... MYCOPROTEINS.

BfR SPACE LAB

MINERALS, BUT NO PROTEINS.

This text version is a translation of the original German text which is the only legally binding version.

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Publisher:
German Federal Institute for Risk Assessment

Max-Dohrn-Straße 8-10
10589 Berlin, Germany
T +49 30 18412-0
F +49 30 18412-99099
bfr@bfr.bund.de
bfr.bund.de/en

Institution under public law
Represented by the president Professor Dr Dr Dr h. c. Andreas Hensel
Supervisory Authority: Federal Ministry of Food and Agriculture
Responsible according to the German Press Law: Dr Suzan Fiack
VAT ID No. DE 165 893 448

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