TECNIPLAST
innovation through passion

PANORAMA NEWS

WINTER 2022/2023 **N°84** QUARTERLY NEWS SHEET

NEW PAPER

THE CAGE CHANGE: A MAJOR IMPACTOR OF THE IN-CAGE LIFE OF SMALL RODENTS

On behalf of the authors, Brun Ulfhake sums up for us the recent paper on the use of DVC® System during the cage change

Although alternatives are becoming more numerous and (are) validated, non-animal experiments can still not substitute all in vivo experiments. Studies that need to use live animals should be conducted deploying all possible refinements to minimize the harm inflicted and, furthermore, designed to produce conclusive results using the smallest number of animals possible.
Optimisation of husbandry routines is an important component of refinement and for laboratory rodents a cage-change that does not keep the cage interior at a high standard has proven to be one key element. Indeed, many studies have given evidence that the cage change is quite intrusive and stressful for the inhabitants, upsetting behaviour and sleep pattern, impacting the heart rate and blood pressure to name a few examples.

The impact of cage-change is a factor that clearly could impact the results of any study on small rodents. A good balance between leaving the animals undisturbed and an in-cage hygienic situation fitting the needs of the animals must be achieved.

Brun Ulfhake, MD, PhD, Senior Professor - Department of Laboratory Medicine at Karolinska Institutet, is one of the authors of the multicentre study on spontaneous in-cage activity and micro-environmental conditions of IVC housed C57BL/6J mice during consecutive cycles of bi-weekly cage-change.

Dear Brun, your article is important for the LAS community both for PIs and Facility Managers. Can you summarize it for our readers?

The reason for our study was to provide a more complete description of in-cage life and animal health during repeated bi-weekly cage changes.
We chose to study a mouse strain (C57BL/6J) which is very commonly used in life science research. **By using the DVC® for housing, we could record in-cage rest and activity day and night across the cage-change interval.** Furthermore, we used the DVC® technology to identify the position of the latrine(s) in the cages. The cages were custom adapted with small closable holes to enable

measurement of ammonia across the full width of the rear middle and frontal sections of the cage floor. Thus, ammonia levels were collected during flow conditions and without having to remove the cage from the DVC®. Ammonia measurements were effected using an electrochemical detector technique at regular intervals (6-7 times) of each cage-change cycle. By the longitudinal gathering of in-cage activity, latrine positioning and ammonia levels, it was possible to compare the first and second week of the cage-change cycle. By analysing repeated biweekly cage change cycles, variations across cycles could be estimated. **Another important feature of this study was that it was conducted in parallel at facilities in four different countries within the EU.** This allowed us to identify observations that were common across sites from those that only showed at single sites. Finally, at one of the sites, the protocol was extended to include outcomes when housing density was changed from four to two animals, and when the bedding was changed from aspen chips to corn cob. Here we also measured in-cage bacterial load after bi-weekly and weekly cage-changes. At the end of the experiment, the upper airways of randomly selected mice were subjected to histopathological analysis.

DVC® has been an important tool in conducting the study and collecting such important data. Can you comment on it?

Importantly, in this study the DVC® technology enabled us to continuously monitor the home cage activity and rest of animals, without disturbing them. For us the spatial resolution provided by the twelve electrodes localized outside of the cage gave us the opportunity to analyse not only activity but also how the mice use the cage floor across cage-cycles. This is another important result of our study. Moreover, we used the drop in resistance due to wetting of the bedding to identify the location of the latrine inside the cage and relate this observation to the animals' use of the cage floor.

What are the results of the study?

Our data show that cage change induces a marked increase in activity (~40%) being more pronounced during daytime when the animals normally rest than during nighttime. The subsequent decline from this activity burst occurred during the first week. Thus, the data strongly support the notion that from the animal's perspective, **bi-weekly cage change is to be preferred over weekly cage change.** Irrespective of the cage change frequency, **the impact of a cage change is such that it must be incorporated into the experimental design as a variable.** The histopathological examination of the nose cavity revealed mild to moderate signs of abnormalities that did not convey with the recorded in-cage ammonia levels. Seven out of the nine morphological signs were also present in the germ-free mice with no lifetime ammonia exposure suggesting that these may be caused by other in-cage components such as dust or chemicals from the bedding material. Further studies on bedding materials are needed. A distinct improvement in in-cage microenvironment would be the development of a nontoxic and dust free material with properties that reduce the production of ammonia while meeting the demands of the mice.

Can you comment on the DVC® technology and tell us your vision of DVC® in the lab animal industry in the short term?

The DVC® technology is scalable using a standard IVC housing system. It is already used as a tool for facility management and emerging application may assist in notifying early-on a range of abnormal activities in the cage. The collection of data from the system does not call for an advanced digital infrastructure, such as massive data storage and processor power. **The 24/7 output of the system can be analysed in close-to-real time and provide unsupervised data on home-cage rest and activity, and with single housed animals also locomotion.** Several more recent papers have shown that it is also a powerful tool in research of spontaneous 24/7 behaviours of small rodents and **ideal for swift capturing of rhythmicities such as the circadian rhythm of day and night** (PONE, 2019). We have used the system to study rhythmicities in home-cage activity induced by husbandry routines (PONE 2019). Using cumulative records covering about 1.5 years, we were able to discover that laboratory mice show a slow rhythmicity (~3 months) in activity with a large effect size (≥0.7 SD) (Scientific Rep 2021). I would also like to mention that the system can be complemented with other features such as sound pickup, video capturing and more. It should be noted that such add-ons will increase the demand on the local digital infrastructure but feasible when only a smaller number of cages are equipped with add-ons. **I am convinced that home-cage monitoring is the future in studies of the behaviours of small rodents.**

GIORGIO ROSATI
SENIOR PRODUCT MANAGER DIGILAB
TECNIPLAST S.P.A.

THE EARLY DAYS OF TECNIPLAST IVCs: Individually Ventilated Cages made of Innovation, Vision and Courage

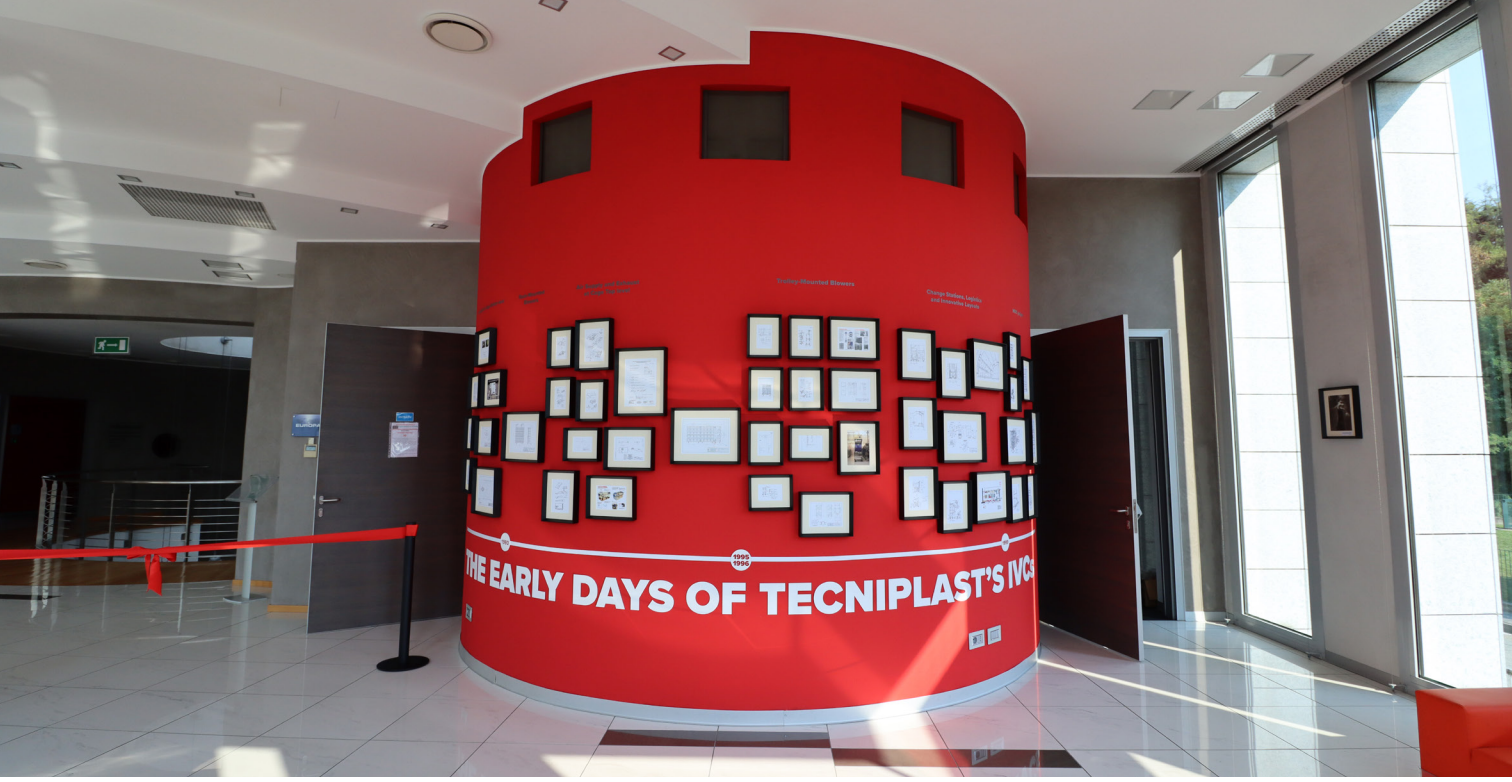
> *"It is essential to know, remember and cherish our own origins. They define our present and lead us into the future"*
>
> Carlo Bernardini
> Tecniplast Group founder

"It is essential to know, remember and cherish our own origins. They define our present and lead us into the future"
[Carlo Bernardini, Tecniplast Group founder]

Inspired by these words and vision of our founder, **Carlo Bernardini**, we conceived, developed and proudly opened to customers and colleagues **a new exhibition area at our Headquarters, named "The early days of Tecniplast's IVCs".** Thanks to technical and original hand-drawings dating back to the early/mid Nineties, we have re-traced the brilliant intuitions and the various stages of development that led Tecniplast to the design of our unique Ventilated Cages. It is our way of saying *"thank you"* to the small, yet visionary group that, in less than 10 years, had the courage to dare, to break the mold, to go beyond conventions and current technologies, to finally conceive the most highly-performing, ergonomic and animal-friendly caging system on the market.

"I remember my father spending whole days and long evenings drawing and testing, discussing and evaluating options, imagining a different way of conceiving Housing Solutions and Laboratory Research, always keeping animal welfare at the forefront" recalls Pietro Bernardini, Managing Director of Tecniplast, and son of our founder Carlo. ***"He was determined yet gentle: he always respected the views and ideas of everybody involved in the project,***

> *I remember my father spending whole days and long evenings drawing and testing, discussing and evaluating options, imagining a different way of conceiving Housing Solutions and Laboratory Research, always keeping animal welfare at the forefront*
>
> *Pietro Bernardini*



> *He was determined yet gentle: he always respected the views and ideas of everybody involved in the project, inspiring and driving the whole team towards success. I remember those days as intense and full of unrestrained enthusiasm: everybody was animated by the desire to do new things, to lead the way towards an innovative era of Lab Animal Housing, to write a completely new chapter in the LAS industry*
>
> *Pietro Bernardini*

inspiring and driving the whole team towards success. I remember those days as intense and full of unrestrained enthusiasm: everybody was animated by the desire to do new things, to lead the way towards an innovative era of Lab Animal Housing, to write a completely new chapter in the LAS industry".

...and what a successful chapter it has been!

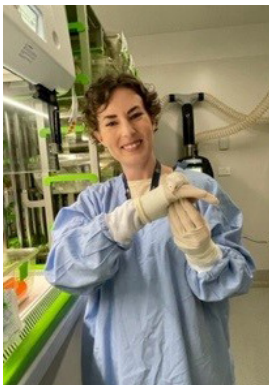
Get ready to plunge into this new evocative addition to the narratives of the Tecniplast world on the occasion of your next visit to our Headquarters - we'll be glad and proud to accompany you on this journey into the past, with our eyes turned to the future!

SILVIA DALLA COSTA
COMMUNICATION AND EVENTS MANAGER – TECNIPLAST S.P.A.

THE SUCCESS OF TECNIPLAST AUSTRALIA: ANZLAA CONFERENCE 2022

Carlee Mottley, Animal Facility Technical Officer from the University of Wollongong, Faculty of Science, Medicine and Health


Vesna Valic, Country Manager Tecniplast Australia & New Zealand



Carlee Mottley, Animal Facility Technical Officer from the University of Wollongong, Faculty of Science, Medicine and Health is the proud recipient of the 2022 ANZLAA Member of the Year Award, which was announced during the recent ANZLAA (Australian and New Zealand Laboratory Animal Association) Conference in Sydney Australia.

Vesna Valic, Country Manager - Tecniplast Australia & New Zealand, had the pleasure of interviewing Carlee for Panorama to find out the details of this award and how this award, and the Tecniplast Scholarship Program, have benefitted her and the LAS industry.

They also talked about the recent **Tecniplast Fancy Dress Trivia Night**, that was held as part of the ANZLAA Conference program and attracted over 100 attendees, from early career technicians through to senior managers and university directors, about the importance of these type of activities for our community especially as we are now coming out of the pandemic period.

Hi Carlee, congratulations on receiving the ANZLAA Member of the Year Award, can you please tell our audience about your contributions to ANZLAA that have led to this award?

Thank you Vesna! The award is to celebrate ANZLAA members who have made outstanding contributions to animal husbandry and health, ethical conduct in research and teaching, exchanging information within the research animal community, and developing alternative techniques to the use of animals. In my role as an Animal Technician I have been able to meet these requirements through high husbandry and welfare standards, training our researchers in ethical animal research and procedural techniques, and developing novel improvements such as the establishment of a rehoming program for ex-research animals and my work to develop an alternative to the Forced Swim Test. I have been a member of ANZLAA since 2013 and throughout this time I have participated in many conferences and presentations. I have been an ANZLAA State Representative for the last 3 years and love connecting with the ANZLAA community and their stakeholders.

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EVERYDAY HERO SCHOLARSHIP NOMINATION FORM

LAB ANIMAL WELFARE & SCIENCE

The Tecniplast Australia Everyday Hero Scholarship is about celebrating the unassuming Heroes within the ANZ LAS industry who display dedication, fairness, respect and innovation.
This image was part of the promotion for the Scholarship Nomination Forms.

You have previously won two Tecniplast Animal Welfare and Science Scholarships, based on your interest in fostering an alternative to the Forced Swim Test for Rats, can you please provide our audience with an overview of your interest in identifying an alternative method and what your results have shown?

The Forced Swim Test is used to assess depression in rodents and involves placing the animal in an inescapable cylinder filled with water. This naturally raises some animal welfare concerns, and there are questions around its integrity and reliability in detecting a depressive-like state. This has led to a lot of institutions around the world banning the test, with unknown implications for research. My facility was one who banned the test, and our researchers were concerned that they would not be able to conduct or publish their research. This made me realise that the only way to improve animal welfare and maintain research output would be to develop an alternative behaviour test. **I designed three novel tests**, and one of these (the Faux Predator Test) was found to be able to detect a despair-like state in rats like the Forced Swim Test. **It's possible that this new test could be used to replace the Forced Swim Test with further test refinement, therefore addressing the 3Rs and reducing the incidence of adverse events** related to water or exhaustion that can sometimes occur with the Forced Swim Test. I am hoping to publish the results of this study in a journal soon.

How has the Tecniplast Scholarship and winning the ANZLAA Award helped you in getting the message to the LAS community that there are alternatives to the Forced Swim Test that are worth exploring?

Without the Tecniplast Scholarship, my idea to replace the Forced Swim Test would have remained as just that. In my role as an Animal Technician I am not normally involved in research and certainly do not have access to funding. The Tecniplast Scholarship provided me with the funding to purchase animals and resources in order to conduct my experiment and develop an alternative behaviour test, and my involvement with ANZLAA has provided me with an industry platform to present this work to the wider laboratory animal community at their conference. **Tecniplast Australia have always been generous about giving back to the LAS community, and I**

feel honoured to have been able to contribute to improving animal welfare and science through provision of their Scholarship.

You participated in the Tecniplast Fancy Dress Trivia Night, what do you believe are the benefits to the LAS community with these type of events?

Social events are so needed and appreciated in the LAS community! Animal research facilities are often quite isolating places to work, and this has been amplified the last few years due to lockdowns relating to the Covid-19 pandemic. The Tecniplast Fancy Dress Trivia Night held at the recent ANZLAA conference was our first opportunity since 2019 for our community to get together and network in a very fun and engaging way! In addition to quality products and service, **Tecniplast Australia are well known for their hospitality and these social opportunities are treasured by the LAS community in Australia and New Zealand.**

VESNA VALIC
COUNTRY MANAGER
TECNIPLAST AUSTRALIA & NEW ZEALAND

TECNIPLAST EVENTS: SOME EXPERIENCES WITH DVC® EXPERTS

Vootele Voikar was one of the moderators during the last DVC® Forum and, as Action Chair at the COST TEATIME initiative, he shares with us his opinion about these important events in the Tecniplast Headquarters.

Dear Vootele, we know that you recently presented at the Digital Vivarium Forum 2, an event held in Tecniplast on the last 6th of September 2022. Could you kindly share your opinion and feedback about this event?

First, I would like to congratulate Tecniplast for organizing such a great meeting and thank the organizers for inviting me to give a talk there. I was very much disappointed by the fact that I could not attend in person (due to sudden illness), however, the last- minute decision to make the event as a hybrid turned out to be an excellent choice. The virtual platform worked perfectly and I am sure, people online enjoyed the scientific content as much as those present in the lecture hall. Of course, we were missing some personal touch and discussions during the coffee breaks and social gatherings. I was happy to attend the first Digital Vivarium Forum in 2019. The friendly atmosphere and lively discussions about future perspectives in using laboratory animals in biomedical research during that meeting made me eagerly wait for the next events. It had to be a longer wait due to the pandemic, but the outcome of DVF2 was great. In addition to presentations of research done with DVC® technology, I appreciated the openness of the symposium to other technology providers. I think it shows that in the end, **"sharing is caring"** and the competition in the field should be indeed seen as a collaborative effort towards better tools in animal research. **We all have agreed that holistic view on animal behavior can improve many aspects of working with disease models** (better monitoring of diseases symptoms, treatment effects, humane endpoints etc.). However, there is no system available which would capture equally well everything in animal behavior and physiology. Thus, there is a lot of room for improvement, but also admittance that research questions dictate the systems to be used, and there may be a niche for different manufacturers in providing best solutions for neuroscience, laboratory animal science, cardiovascular or metabolic research etc. However, every discipline would greatly benefit by knowing their animal models better, and 24/7 monitoring has a potential to enable it.

Overall, **DVF2 was a fantastic event to get updated on these efforts, and to meet people who care and together develop the future of animal research.**

We know you have a position as Action Chair at the COST TEATIME initiative. Could you kindly tell us more about this initiative and what you are targeting?

COST (European Cooperation in Science and Technology) is a funding organisation for research and innovation networks. At the the beginning of 2020, I initiated a discussion group between some researchers and core facility managers in Europe, working on behavioural phenotyping of mouse models. **The idea was to have a forum for open discussion on problems and pitfalls in this field and sharing the best practice** – very much inspired by ongoing concerns about reproducibility in biomedical research. This group was warmly welcomed

by many, and then we started to think about sustainability and common goals. One of us, **Sabine Hölter**, pointed out that there is an open call for COST Actions, and we started to work on should be proposals for creating such **a pan-European network of researchers and other stakeholders interested in improving biomedical research with animal models.** It was not difficult to find the topic for this network – **Home Cage Monitoring (HCM)!** The proposal was submitted in November 2020, we received a positive decision on funding in May 2021, and kicked off the project in October 2021. By now, **this network comprises over 120 researchers from 34 European countries.**

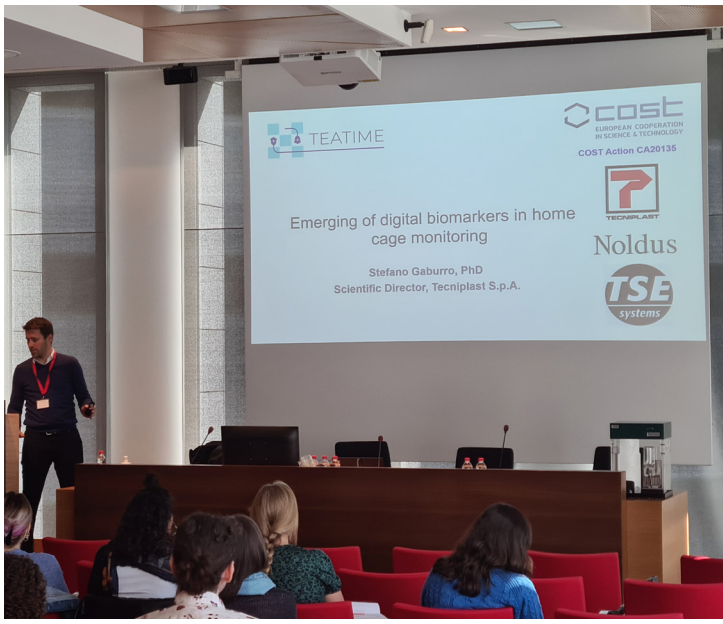
To get familiar with the COST Action 20135 "Improving biomedical research by automated behaviour monitoring in the animal home-cage (TEATIME)" I recommend you visit our website, https://cost-teatime.org/. However, in a nutshell, **the aim is to bring together the stakeholders using and developing automated home-cage monitoring technologies,** and critically and transparently assess the potential of these technologies. We are conducting the survey to gather views to inform future developments and challenges in systems which monitor animals in home cage environments; we are conducting a systematic review on the current status and use of HCM; we are working on understanding the needs and providing the potential solutions related to data analysis, as this is obviously one of the hurdles in using these systems. These objectives fall into the category of generating new knowledge. However, a very important part of the Action is sharing the knowledge and generating output. To this end, the Action provides a grant system for young researchers to attend international meetings and present their work related to HCM. In addition, grants will be available for short-term scientific missions where researchers can visit another laboratory in a member country in order to carry out a short experiment or learn new techniques. **I have to stress that COST Actions are strictly monitoring the policy**

of excellence and inclusiveness. These are bottom-up networks and the Actions will take into account **the three main tenets of excellence and inclusiveness policy – geographical diversity** (include researchers from the full European Research Area), **promoting and including young researchers and innovators** (age < 40 years), and **gender balance.** The networking nature of Action is further stressed by strong emphasis on communication and dissemination of our activities and scientific output. We have created accounts for COST_TEATIME in Twitter, LinkedIn and YouTube. In our YouTube channel, everyone interested can watch the recordings of TEATIME webinars where researchers share their experience in using a variety of novel approaches to monitor animal behavior.

Recently, there was a COST TEATIME training school week, again held in Tecniplast, where young PhD students discovered more about the importance of Home Cage Monitoring. This is really a fast-growing community, could you share some feedback about this training week?

Our first introductory training school was a great success, indeed! We received 55 applications, which were evaluated by our selection committee and, based on the motivation and excellence, 24 students from 14 countries were selected to attend the school. As confirmed by the faculty, this selection was really excellent – open-minded students, challenging with their active engagement also the faculty. This was also highlighted by the students. In the course evaluation, most of them agreed that the course was of high quality, structure and organization was very good, and very importantly in my opinion – the course promoted interaction between the participants at all levels. From personal experience (both as a student or teacher) I can confirm that in addition to new knowledge gained in such training events, the new contacts, discussions and informal sharing of one's experience are the most valuable outcome! **Excellent location and professional support by Tecniplast in all practicalities certainly contributed positively to the success of the course!** There were many people involved in faculty and local teams – I want to thank them all! I will finish this answer with the words of one student –

> *"Overall, I highly appreciate the TEATIME efforts and what they did. I really want to participate again."*



Keep an eye on our website, or sign up to news, in order not to miss the next events!

Can you comment on the DVC technology and tell us your vision of DVC in the lab animal industry in the short term?

I do not yet have personal experience with DVC® technology, all I know is learned from presentations and personal communications. However, I see a great potential there. As mentioned, there is no better all-in-one solution available to monitor everything we are interested in the life of a laboratory rodent – activity, sleep, food and water intake, social interactions, metabolism, cognitive functions and emotionality. Moreover, the requirements differ for different purposes. In addition to research questions, the routine husbandry and welfare monitoring may require different approaches. However, as the majority of rodents in European animal facilities live in the caging systems provided by Tecniplast, I would say that not knowing anything about what happens with the animal during the time they spend in their home cage is really a waste, if the technology is available that could inform us at least of some features. Therefore, **the DVC® has in my view a clear niche in collecting data from real, unmodified, scalable home cages and I know that the company is making huge efforts in maximizing the amount and quality of these data.**

STEFANO GABURRO
SCIENTIFIC DIRECTOR
TECNIPLAST S.P.A.

GREEN PACKAGING @ IWT

The climate is changing and we're realizing it day by day. We used to live as if we had limitless resources and no climate changes, and this careless behaviour modified the delicate equilibrium of our Earth. We have to deal with environmental pollution, temperature variations and the increased quantities of packaging waste.

Before the green revolution, ethylene-based films and Styrofoam were the materials of choice for wrapping and packing any kind of manufactured goods. Nobody paid attention to environment pollution, and plastic was the cheapest, most employed solution for guaranteeing appropriate product protection, ideal wrapping and a long-lasting life of the packaging. Unfortunately, **the short-term advantages were hiding severe long-term drawbacks.**

Nowadays, producing excellent products is not enough to deliver a business of high quality. You need to be able to do so, together with reducing the environmental impact of your production process, because **progress doesn't exist without environmental respect and responsible behaviours.**

IWT strategy on Green Packaging

IWT strategy on packaging arises out of the green commitment of the Tecniplast Group as a whole. We have embraced the United Nations 2030 Agenda for Sustainable Development, as demonstrated by our policies. We actively reduce our global carbon footprint with our widespread recycling initiatives and our dedication to conserving natural resources and combating negative impacts on climate change.

We strive to create manufacturing processes and products that are increasingly environmentally friendly, as demonstrated by our Environmental Report compliant with ISO 14016 management system, our Eco-design process according to ISO 14006 standards, as well by Tecniplast's 14001 and 9001 certifications. Whilst focusing on this, we also focus on maximizing productivity and efficiency, minimizing our environmental impact by increasing the recycling capabilities of packaging materials. And as always, we continue to deliver the high-quality solutions our clients expect from us.

Is it possible to replace high impact plastics in packaging?

IWT depts have proudly substituted all the high impact plastic packaging materials with **safe, biodegradable, 100% recyclable alternatives**, compliant with the European essential requirements for green packaging published by the European Committee for Standardisation (CEN).

The authority requirements can be summarized as follows:
- Both weight and volume of packaging must be the minimum possible so as to ensure customers' safety, hygiene and acceptability;
- No dangerous materials or substances have to be present;
- Materials must be reusable, compostable, biodegradable or employable for recovering energy.

Previous packaging	Green packaging
Styrofoam and polyethylene foam	Honeycomb cardboard panels
Plastic pluriball	Green pluriball
Plastic extensible films	Biodegradable films
Plastic adhesive tape	Polylactic acid (PLA) adhesive tape
Plastic protective guards	Recycled crumpled paper

Our green packaging revolution

The following list gathers the elements of IWT green packaging strategy and, together with the previous table, explains the advancement in sustainability starting from the old materials, up to the new solutions.

Protective packaging

Styrofoam and polyethylene foam panels have been dismissed, in favour of honeycomb cardboard panels, which are eco compatible and plastic free.
A new generation of green pluriball has also replaced the old choice. 100% made in renewable energy companies. This is a sustainable alternative, composed of recycled plastics only.

Plastic extensible films

IWT packaging dept has replaced all of the high impact plastic extensible films for manual and machinable use with a new generation high-performance film 100% biodegradable. Made of polyethene, this film holds an innovative additive that can break the polymer structure without leaving residue in the environment. It's activated by sunlight exposure, air and humidity, and at the end of the process, no more polyethene or microplastics are present.

Adhesive tape

An adhesive tape in PLA (polylactic acid), has replaced PVC and polypropylene products. It is a 100% BioSource and biodegradable renewable polymer which delivers the same performances in terms of transparency, resistance and ease of cutting. Additionally, the embedded adhesive is water-based and solvent-free, revealing an additional step in the right direction towards environmental care.

Protective guards

We've refreshed our guards by substituting plastics with recycled crumpled paper, prepared in real time at our production department, with a paper filling system.
This eco-friendly solution is quick to produce and easy to handle for the customer, since you can group all waste together and collect it in the paper waste collection.
If you are interested in this process, watch the video taken at our Headquarters.

The first steps of our sustainability journey

These four steps summarize IWT dedication in promoting sustainability and our commitment in improving processes to enhance respect for both people and the environment. Thanks to every single step along the sustainability journey, we have eliminated high impact plastics in packaging, achieved the waste reduction goal and helped our customers to do the same. Caring for the environment starts from the smallest of gestures, and with commitment and investments, it's possible to reach the highest goals, like the zero environmental impact.

These are just some examples of our commitment to sustainability: at Tecniplast Group, we continue to lead and encourage others to join us in improving the health of our planet. Because, after all, our business is about taking care of our present and future, and creating a better tomorrow, as well.

ALESSANDRA TOSIN
COMMUNICATION & EVENTS SPECIALIST - IWT S.R.L.

TECNIPLAST OBTAINED AN OVERALL SCORE OF GRADE "A" IN THE CERTIFICATE FROM SYNESGY ORGANIZATION

Tecniplast considers Environmental, social and economic sustainability and its ever-increasing impact an essential factor in management decisions and in the evaluation of companies.
Tecniplast, as the best companies around the world are, is adopting the 17 Sustainable Development Goals of the UN 2030 Agenda. Moreover, Tecniplast respects the E.S.G. (Environmental, Social, Governance), which has driven us since 2005, shaping our sustainability strategy. We anticipated once again requests from consumers and identified another sustainable competitive advantage in the minds of our customers.
The certification of Synesgy is another important component of our credible sustainable strategy.

Synesgy
The sustainability network.

L'azienda **TECNIPLAST SPA** ha compilato in data 13 giugno 2022
il questionario Synesgy.

Il questionario Synesgy ha validità **1** anno dalla data di compilazione.

CRIBIS
A CRIF company

What is Synesgy in more detail?

Synesgy assesses the sustainability of our supply chain and **it is the first global network dedicated to the ESG world for Large Corporations and SMEs which aim to increase awareness and transparency in the processes of the production chains.** Synesgy is a global digital platform that allows commitment to environmental, social and governance issues to be detected. At the end of process companies obtain, if everything is correct, a certificate valid for 12 months. **Tecniplast obtained an overall score of grade "A": that will be generated to be shared with your business partners or exhibited on your website.**

Benefits of this Certification:

- Improve the sustainability of our supply chain through an accurate turnkey survey system, constantly updated;
- A greater transparency in the impact assessment of the production process on our supply chain, based on parameters consistent with international regulations;
- It is a full Credit of our supply chain to the market by promoting its appeal to credit institutions and investors;
- We have aggregated dashboards and ESG Scores that help us prevent operational risks and better manage our supply chain.

In production processes such as ours, where on average 90% of the environmental impact is determined by the supply chain, it is essential to monitor our suppliers' sustainability; **Synesgy allows Tecniplast to verify the degree of sustainability of their supply chain.**

This Certificate guarantee that we will be able to collect precise and verifiable information on how our suppliers are positioned on the various ESG (environmental, social, Governance) **performance indicators;** in this way we increase transparency of our supply chain towards our customers.

Reliability from important and international Auditing companies:

Synesgy is part of CRIF Group, specialized in commercial information on Italian and foreign companies. CRIF is a global company specializing in credit information and business information systems, analytics, outsourcing and processing services as well as advanced digital solutions for business development and open banking. The CRIF group is present in 4 continents (Europe, Asia, America and Africa): 30 countries with direct activities and 70 companies and a turnover of almost 600 million. Today, over 10,500 banks and financial companies, more than 600 insurance companies, 80,000 businesses and 1,000,000 consumers use CRIF services on 4 continents. Furthermore, CRIF is included in the prestigious IDC FinTech Rankings Top 100, the ranking of the leading providers of global technology solutions for the financial services sector, and in 2019 it completed its coverage as AISP in 31 European countries where the PSD2 directive is applicable for open banking.

For more information: www.crif.it

LEOPOLDO ZAUNER
CORPORATE MARKETING & COMMUNICATION DIRECTOR
TECNIPLAST S.P.A.

DOWNLOAD THE TECNIPLAST SUSTAINABILITY REPORT

AALAS 2022: *PANORAMA* MEETS JOHN HASENAU

John Hasenau presented two interesting and well participated seminars at the recent Aalas in Louisville.

SEMINAR 1 The first one was on Automated Rodent Housing Systems and how it could Improve rodent oncology studies.

The seminar described the concept of transitional digital biomarkers and their use in automated home housing systems. It showed how these concepts can improve the animal welfare component as well as the study outcomes, both on efficacy and safety aspects.

John, can you comment on the overall objective of the seminar and the results of it?

This Seminar was an introduction of **what digital and translational digital biomarkers are and how they are used to achieve non-invasive data collection** as well as digital welfare of the animals. I introduced the NA3RCs as a pivotal point for the research in developing agreed on shared terminology and shared technology platforms to allow this community to readily advance. Digital biomarker use with bio-exclusion studies as well as biocontainment housing was discussed as a best case opportunity to allow housing interventions only when essential, and to improve the efficiencies of the research and care staff. Translational digital biomarkers have a much better model preservation (bio-exclusion) as well as model safety enhancements (biocontainment).

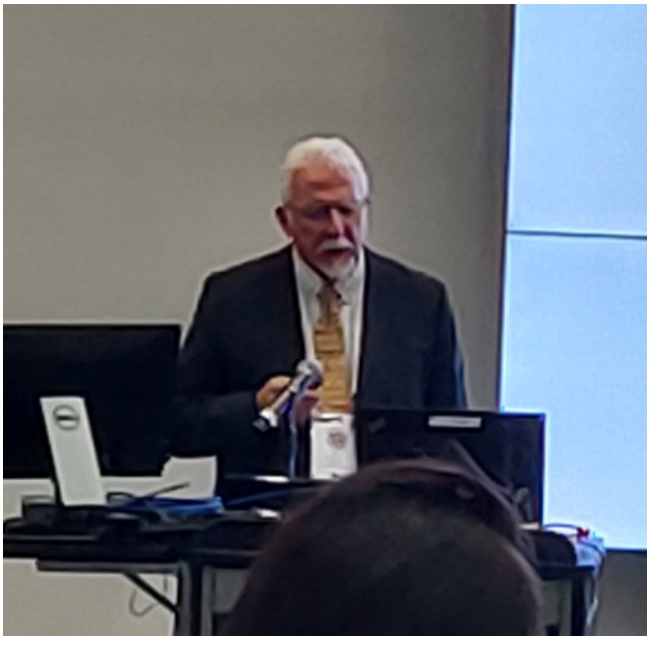
This seminar also showed **appropriate housing to maintain the animals' status**, as required through interesting examples, using automated home housing systems to monitor animal activity (a group of transitional digital biomarkers), allowing continuous, longitudinal, and non-invasive monitoring in the environment.

A melonoma researcher **(Dr. Vyara Matson)** who studies the gut microbiome on the efficacy of immunotherapy in melanoma, discussed having consistent data and longitudinal monitoring of the animals and the benefits that could be seen with digital monitoring use. In addition, we heard from the head of an In-Vivo research center in Europe **(Dr. Pierre Lainee)** who has extensively worked with the DVC® system. His experiences with Oncology studies and the ability for early indications and interventions to improve animal welfare and the models was presented.

What comments and questions were there from the audience?

The audience realized that due to the nocturnal nature of the animals' **optimal data collection and any eventual interventions are best carried out during the nighttime (high) activity period.**

There was also realization that **housing change outs have impacts on normal resting activities** and these should be best correlated with study activity when possible. Another take-home point was **the use of additional (add on) technologies**, such as video that was presented, have better study outcomes and screening opportunities for the research components of the system.



SEMINAR 2

The participation in the other seminar about thermoregulation and how it can affect energy expenditure for rodents, was very successfully too.

The discussion was about Thermoregulation and its energy expenditures for rodents, and the effects of these energy expenditures on study outcomes.

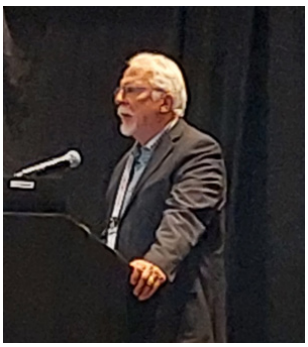
John, can you tell our readers about it and about the discussion of Thermoregulation?

This Seminar was dedicated to **Dr Chris Gordon** who was a pioneer and leader in this field. The seminar highlighted what is currently in the **Guide for the Care and Use of Laboratory Animals for room** holding temperatures and the relationship to the animals Thermoneutral Zone. There was an emphasis on behavioral thermoregulation and allowing the animals choice in this regard giving them appropriate housing and environmental items for this. **A concern around airflows at the animal level and the evaporative cooling effects from this with potential Guide updates was discussed.**

The seminar explored effects on study outcomes, specifically in the areas of **immunology and oncology**, including why this issue is critical to the translation of preclinical findings to the clinic. Presenters discussed **the monitoring of the microenvironment** to ensure the housing design specifications were met.

In your opinion, is it still appropriate in relationship to the operating environment?

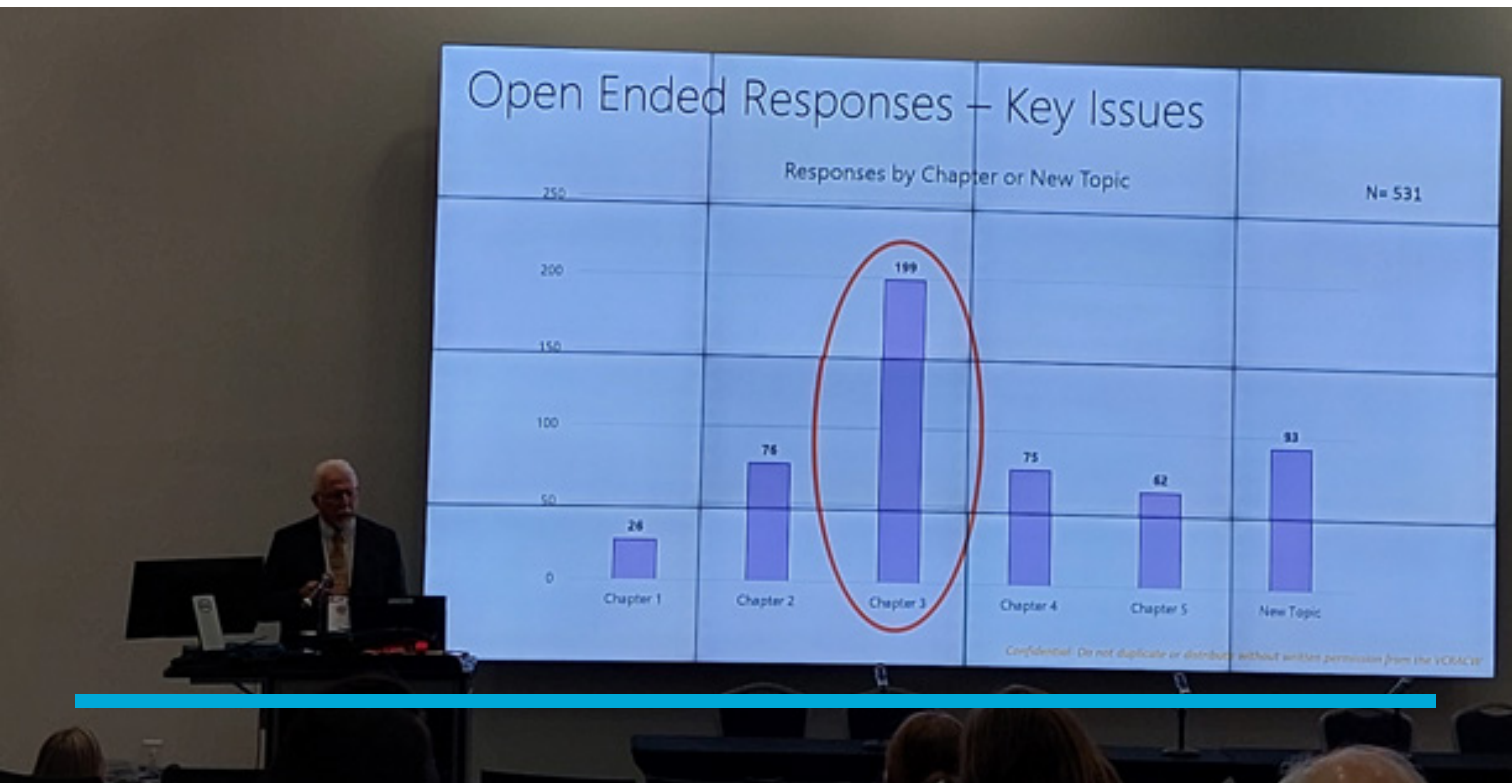
In the areas of immunology and oncology outcomes the extrinsic temperature effects can be very impactful and there is increased awareness of this from the research community and a higher request from the community for more operating environments to have higher temperatures to more closely reach the Thermoneutral zone.



The Seminar discussed **newer designs which allow zones of thermal gradients in housing units**, their acceptance and use by the animals and their potential for more accurate study outcomes.

How can they improve experimental outcomes and how should future guidelines take them into consideration?

Housing units that have these zones of choice incorporated in the units allow the mice to choose more readily their TNZ. Studies have also shown that when too much heat is given this is not behaviorally desirable for the mice. Studies that allow animals to achieve their TNZs more readily have shown that there are higher amounts of translation as regards the immunological and oncology areas. Research in this area may be focused more on this in the future.



AALAS 2022: *THANK YOU!*

Thanks to everyone who joined us in Louisville and a truthful standing ovation to all those who worked so hard to make this possible! You made AALAS 2022 memorable!

See you next year in Salt Lake City!

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