

ACC&D THINK TANK AND INNOCENTIVE® CHALLENGE RESULTS

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This presentation will discuss the results of ACC&D's InnoCentive® Brainstorm Challenge and Scientific Think Tank to identify and prioritize marking methods for non-surgically sterilized cats and dogs. These initiatives occurred, respectively, in winter and spring 2013. Each is detailed below.

ACC&D is working to identify a new and/or improved method for marking dogs and cats, particularly free-roaming populations, who have been treated with a non-surgical permanent sterilant or long-term contraceptive. This addresses the question about how animals treated non-surgically will be recognized if there is no physically visible indicator(s) of treatment, and how additional important information (such as expiration date of a temporary contraceptive) will be easily conveyed. The need for a method to mark treated animals has become increasingly pertinent since non-surgical contraceptives and sterilants, including Suprelorin® and Zeuterin™/EsterilSol™, are now approved and available in certain countries.

As a preliminary step toward developing a better way of marking and identifying non-surgically treated animals, ACC&D reviewed the current methods used to mark and identify animals, including wildlife and livestock. The strengths and weaknesses of each were evaluated. This review helped define the desired characteristics of a marking mechanism:

- Visibility at moderate distances
- Humane application without the need for prior anesthesia
- Lifelong permanence (or multi-year duration)
- Minimal interference with normal behavior or relationships with humans
- Capacity to transmit information, including identification of individual animals, if possible
- Ease and efficiency of application and recognition
- Low expense

Crowdsourcing: InnoCentive Brainstorm Challenge

ACC&D's next step: using crowdsourcing to reach the global community and elicit novel solutions. With funding from Dr. Amy Fischer and using criteria established after the review of current marking methods, ACC&D initiated an InnoCentive Brainstorm Challenge in early 2013.¹

Seventy-four active solvers submitted a total of 99 "solutions," which ranged from modifications of existing marking techniques to truly novel inventions of various utility and feasibility. Using an established set of criteria, the ACC&D Marking Project Team evaluated each proposal and selected a winner and runner-up from each of two categories: a near-term method (with potential to be brought to

¹ InnoCentive is an online crowdsourcing entity aimed to help private, public sector, and nonprofit organizations solve problems. It describes itself as "the global leader in crowdsourcing innovation problems to the world's smartest people who compete to provide ideas and solutions to important business, social, policy, scientific, and technical challenges." (Please see the InnoCentive website, www.innocentive.com, for additional information.)

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use soon), and a longer-term method (a promising solution that requires additional technological development before being introduced). Selected proposals are summarized below:

	Short-Term	Longer-Term
Winner	Gel antibiotic piercing gun with neon reflective ear bands: Secure a color-coded reflective band around the tip of the ear using a piercing mechanism that includes an analgesic and antiseptic. The proposal speaks to the fact that ear tags have not yet been significantly advanced or optimized.	Extended-range RFID: Excellent insights and advice on how to extend RFID range for identifying and tracking free-roaming dogs and cats. Speaks to the value of RFID to maximize information capture, particularly in communities able to take advantage of technological capabilities.
Runner-up	Freeze-branding methodology: Solution includes a detailed freeze branding approach, including a scheme to encode information. Freeze branding is not a new idea and raises concerns about humane application, but the proposal presents a comprehensive approach with new and useful angles on the marking mechanism.	Combined facial and marking recognition: Use facial recognition software and database to ID animals. Author suggests funding database for free-roaming animals by charging pet owners to register pets. The solution requires technology, thus limiting widespread use in the near future, and it would also not help the general public recognize treated animals. The proposal was greatly appreciated for its thoroughness, forward thinking, and inclusion of funding recommendations.

ACC&D Scientific Think Tank

In May 2013, with financial support from PetSmart Charities, ACC&D convened a Scientific Think Tank on identifying and prioritizing marking methods for non-surgically sterilized cats and dogs. The 1.5-day event convened 15 experts from diverse fields: wildlife biology, reproductive biology, software and database design, animal identification technologies, animal handling, and free-roaming cat and dog populations. An InnoCentive winner and runner-up were among Think Tank participants, and experts in invention and innovation were also involved as participants and facilitators.

The review of existing marking options and InnoCentive results, each valuable in its own right, were also building blocks for the Think Tank. Participants were provided the InnoCentive criteria as a foundation upon which they could build—and refine—when brainstorming new marking possibilities.

Participants developed minimum and ideal criteria for a marking method, covering such variables as visibility, permanence, behavioral impact, and application (training required, associated pain, and cost), and information retrieval.

As these criteria were established, participants were particularly intrigued by something on the ear in order to maximize visibility and identification with the naked eye. Team members reached a consensus that existing use of tags has not been optimized in terms of either material or methodology. This applies to use among dogs as well as wildlife and livestock. Moreover, tags have not been seen as a viable option for cats based on minimal exploration, and yet the right design could quite possibly be effective for felines. The team believed that features such as durability, safety, and animal welfare can potentially be enhanced by seeking adaptations of the conventional ear “tag.” This includes using newer, more

advanced materials and technology; giving more careful consideration to animals' ear shapes; and, fundamentally, being more creative. The result: variations on the ear "tag" as we know it.

The team ultimately developed two concepts for ear markers. Each begins with a visible component and has an optional technology add-on. The tiered technological sophistication makes them viable for communities with different resources. The physical components of the two concepts differ; application, community outreach, and technology add-on components are the same.

Physical marker (concept 1): Multi-colored disk made from material that is more advanced than the hard plastic often used in wildlife and livestock tags. Manipulation of disk shape (e.g., concave or convex) could reduce contact with fur or skin and thus chances of infection. All disks would have a standard starting point (e.g., a black segment), and a viewer would move clockwise to obtain different information about the animal.

Physical marker (concept 2): Flexible ear wrap attached with two or more thin posts (based on the assumption that multiple strong, thin posts could affix the wrap while reducing damage to the ear if caught). The wrap would be folded around the edge of a portion of the ear, not unlike the edging or banding on a potholder. Different pieces of flexible material could be melded together to convey information using different colors or symbols.

Application: The disk/wrap would be applied with an ear piercing-type gun rather than the heavy applicator and thick post presently used with ear tags. It would be applied using a local anesthetic, antiseptic, and anti-inflammatory. (One possible product is Tri-Solfen, a local anesthetic and antiseptic gel spray.) General anesthesia would not be needed, although a short active sedative would probably be.

Community outreach: As with any community initiative, outreach and education is critical. The Think Tank team posited providing a matching stud to an animal's caretaker and conducting community education about the meaning of the marker and its colors. Of note, one need not be literate in order to identify and interpret either physical marker.

Technology add-on: Optional technology add-ons are twofold. One possibility would be extended-range SAW RFID; another a QR code. A key feature is that the RFID or QR code would be external, which offers more options for range extension and makes it a feasible technology for getting information on feral or unsocialized animals without having to be close to them or re-trap.

Next Steps

The Think Tank concluded with great enthusiasm for pursuing next steps, which include tag and application design, study design, potential partner outreach, and community considerations. These will be summarized in the Symposium presentation and detailed in the Think Tank Report.

Want to learn more? We invite you to download the full Think Tank report and related resources from the ACC&D website: <http://www.acc-d.org/ThinkTanks>.

Have ideas or suggestions? Don't be shy – let us know! Please contact Valerie Benka, ACC&D Project Manager, at valerie@acc-d.org or (734) 780-7817.