

Question and Answers with Dr. Steven Lukefahr

by Daniel Moore

I have had several email discussions to date and this document chronicles them to date. My initial email pertained only to the TAMUK Composite Rabbit. Further emails broadened the scope somewhat but also honed in on some aspects that seemed needing to be clarified.

On Sun, Nov 27, 2022 at 6:56 PM Daniel Moore wrote:

Hello Dr. Lukefahr,

I am sorry to bother you and I am aware you have retired but I would love to have a discussion with you about your composite rabbits. I have found quite a bit of your research through Pubmed and other online resources but most do not mention the composite specifically. If you are willing I would love to provide you with a list of 10-20 questions or so and a subsequent follow up that would help the current fanciers, myself included, in understanding this strain of meat rabbit and your thoughts and goals that went into creating them and where you felt their highest utility was to found/implemented.

If you are willing to participate I would surely appreciate it and if not I completely understand and thank you for your time.

Thank you,

Daniel Moore

On Tuesday, November 29, 2022 Dr. Lukefahr responded with the following.

Q. I guess to start it off I have read a lot of your studies but I don't recall seeing one where the composite was used. They all seemed to be the evolution of the TAMUK NZW or the Altex. Can you let me know if there are some studies available on the Composite? Or tell me why they weren't used as a subject of research?

A. Yes, there were several projects where both Composites and NZWs were involved, but these were mostly forage evaluation studies and no comparisons were made between breeds.

Q. Some are seeing Rex furred rabbits come from Composite matings. Yet there is no mention of Rex being used in the making of the Composites. Can you enlighten me on that, was any Rex or Astrex introduced that you know of?

A. No, neither the Rex nor the Astrex was included.

Q. And whether they were or weren't used in the Composites have you seen any advantage to the Rex fur or Astrex fur as you did with the Furless?

A. Ditto.

Q. The TAMUK literature points to eight breeds being used in the composite development (New Zealand Red, Siamese Satin, Californian, New Zealand White, Dutch, Champagne d'Argent,

Harlequin, and Havana) Were there any other breeds or hybrids mated with composite lines that aren't mentioned and also why these eight and not others such as the American, Spotted or Vienna White?

A. You are correct about the breeds except that New Zealand is one breed. So actually there were seven breeds. I did not choose the American, Spotted or Vienna White breeds because I wanted more emphasis from commercial meat breeds.

Q. With that in mind what was your selection criteria? By chance do you have a schematic representation of the breeding methodology used in the composites? If so would you be willing to share it?

A. The Composite was selected for consistent performance in a hot environment. The seven-breed Composite also gave a performance boost due to hybrid vigor, as well as producing many different colors (some producers have tanned the multi-colored hides and sold these). No charts were ever developed.

Q. There appears to be some Composite lines where the males fertility is dropping off due to heat, especially over these last few very hot summers in the south. Short of selecting Bucks with proven production in the heat and overall common sense heat reduction measures is there anything else breeders could/should be doing?

A. Cull less fertile rabbits!

Q. And to round this off, if you were breeding today and your goal is a cottage industry back yard rabbitry for food, fun and maybe some profit would you still advise using the composites or do you feel some other breeds/hybrids would better suit those needs?

A. No, not actually.

Hope this helps.

Cheers,

Steven Lukefahr

Good evening,

Yes, it does help and I thank you for taking the time.

Do you mind if I share your responses with other enthusiasts/breeders.

And if you don't mind I only have one follow up.

In light of your response to the question concerning fertility. Can I assume selection and culling to achieve the desired outcome would be the same for any of the traits that lead

to the end goal, ie. Ear size and coat for increased heat tolerance; the larger number of teats for improved feeding of kits; higher fertility rates and birth quantity in does and so forth?

A. Yes, that would be fine. I agree with your statement about fertility.

Steven

My next dialogue occurred months later concerning the furless Rabbits.

On Sun, Aug 27, 2023 at 1:52 PM Daniel Moore wrote:

Hello again, I hope you don't mind me reaching out again. I am going to forward this question with, my interest is mostly in thermoregulation and tolerance within the TAMUK Composite rabbits.

With that said I was looking at other breeds from Europe, namely the Baladi. Pratt and Spanish V lines, and the research around them. Then in my last litter of Composites I have one female who has almost no hair on her back of the neck and also very little on her ears and under her eyes. Which made me recall your work on the "naked gene" and Fuzz's progeny (F1 and F2).

Which brings me to my question and do you know if by chance any of the recessive carriers of the naked gene from your tests were recycled into your NZW Production line?

This is a trait I would love to perpetuate and if there is a chance of recessive carriers in the Composite breed I can start looking and asking other breeders to help in that.

As usual I appreciate any insight you have and are willing to share.

Regards,

Daniel Moore

On Monday, August 28, 2023 Steven Lukefahr replied:

Hello Daniel,

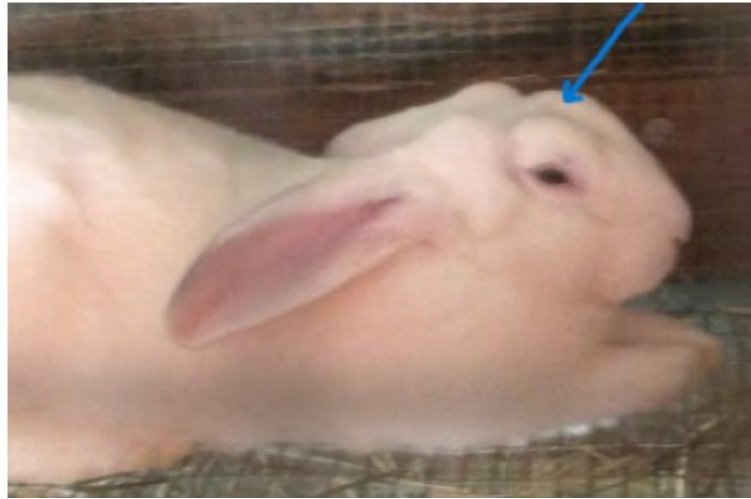
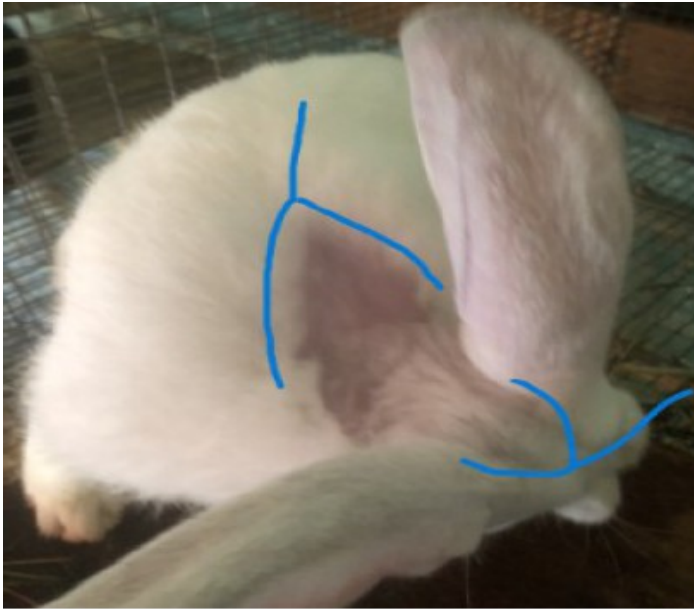
Although unplanned, it is possible that there is a touch of Fuzz in your line.

Steven

Personal notes: Fuzz was the mini Lop that was furless and used as the progenitor of TAMUK's Furless Rabbits.

And the only way the furless gene would have been transmitted to the Composites is through the keeping of some carriers from the F2 generation which for all intents and purposes were New Zealand White in appearance. Which were later crossed into the composites after 2013. More on that later.

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I had sent these pics to him. Showing the extent of hair loss and the locations between the shoulders,back of head, between and around the eyes and on the ears.

This to me looked very similar to pictures that were included in the two of studies reporting the TAMUK furless experiments. Most particularly Class 3.



Photo 2: Class 1 naked rabbit with little to no fur.



Photo 3: Class 2 naked rabbit with a light coat of fur.



Photo 4: Class 3 naked rabbit with a light coat of fur over entire body.

I reached out again much more recently. Most of the questions here were based on what I had seen after finding every substantial update to the Rabbit Research Unit's of TAMUK webpage. It was based on what I saw in the archived pages that made me conclude with the false assumption of the TAMUK Composite having a pre and post 2014 variety. Dr. Lukefahr plainly states in the following that he did not begin to sell composites until 2013. By early 2014 the update to the Rabbit Research Unit states all of the original composites have been sold and all remaining have been hybridized with the TAMUK New Zealand White line.

On Monday, March 18, 2024 Steven Lukefahr wrote:

Hello Dan,

Let me answer your questions, as follows:

Q. I've gone back in time on the Archives of the Rabbit Research website page and noticed the first mention of the 7 breed composite was in 2013. Was this when you first started selling them to the public? Or simply when you felt confident enough to start to promote them?

A. In 2013 is when several of the Composites were first brought to TAMUK. In the same year, they were sold as Composites to the public.

Q. I also noticed in that website it mentions you had began the composite breeding process about 25 years before then, so I am assuming sometime in the late 80's before you moved to Kingsville. Does that sound about right?

A. Yes, when I was living in Alabama.

Q. The website states the order of crosses but not necessarily how they were done. So I was hoping you were willing to expand a little on that? Did you create hybrids then over time cross those hybrids? Was it via three way cross (similar to the Altex) or some other means? And I know it's a longshot but do you recall about what year each cross happened?

A. There was no pattern to when the breed crosses were made, but I do recall first crossing a NZ Red with a Siamese Satin. Besides producing meat for my family, I was also breeding to produce a variety of colors.

Q. I noticed in the 2001 webpage there lists a Pearl variety. Am I safe to assume this was an early composite?

A. No, not a variety. Pearl was a color produced with the Composite.

Q. And lastly, currently they are being called TAMUK Composites. Is that ok with you? Or would you rather they be called Lukefahr Composites? Or does it really even matter?

A. Yes, TAMUK Composites is fine.

I thought that would be my last as it largely addressed all the questions I personally had. Yet later due to discussions I had on my own Facebook group devoted to the TAMUK Rabbits I reached out again.

On Sun, Apr 14, 2024, 1:19 PM Daniel Moore wrote:

Hello again,

Sorry to bother you once again but I just want to clarify some things. I am sure someone else has contacted you about it but I personally feel they asked the wrong questions.

We know the English spotting gene was not seen in any of the seven breeds creating the Tamuk Composite but that's not the question in my mind.

The questions I would like addressed are.

Is it possible that some in your NZW strain carried the English spotting gene but it was masked by the albinism?

Is it possible that some of those or their offspring were sold to breeders?

Is it possible that if any of those NZW who carried the English spotting when bred to a composite by a breeder could have English spotted offspring?

And most importantly in my mind.

Should colors or patterns really matter if all of the other traits and production qualities are exhibited?

Thanks again and i really hate pestering you about this but I personally feel that too many are concerned with just the name and not the traits.

Regards,
Dan

On Sun, Apr 14, 2024, Steven Lukefahr wrote:

Hello Daniel, Yes, Jim e-mailed me earlier today. I never saw English spotted rabbits, and doubt that it was carried by our Nzw rabbits.

Steven

No, I think that colors or patterns matter in terms of production.

On Sun, Apr 14, 2024, I wrote back asking for clarification.

Hello and thank you,
Could you, if you wish, elaborate on how color/patterns would matter in production?

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Regards,
Dan

On Sunday, April 14, 2024, Steven Lukefahr wrote:

I don't believe that it would affect production.

I see. You were answering no to my question about whether it did matter.
Sorry I took it as you thought it did matter.

Also if you don't mind me asking. Were pedigrees given to composite or NZW purchasers as they were with the Altex?

On Monday, April 15, 2024, Steven Lukefahr wrote:

To all buyers

This was the last I had reached out to him for some time. Then in June I received an email from him.

On Thursday, June 6, 2024, Steven Lukefahr wrote: Hello Daniel, Just wanted to know if you have any more questions for me? Steven Lukefahr

After some thought I asked him the following questions and he answered rather quickly.

Hello again Steven and thank you for giving me another opportunity to ask you some questions. The first two are the most controversial and I really want to put this to bed and move along but I would be remiss if I did not ask.

It's well known what breeds went into the Composites as well as the Altex, New Zealand White and Furless. Even though I do believe the Altex and Furless may no longer be available. So with that said,

I did not develop a furless breed. After those experiments, the furless rabbits were all sold to make cages available for new studies.

1. Is there any color or pattern that can absolutely never be expressed in TAMUK rabbits that can express color? I don't like to say never! Plus, there is always a chance of a new mutation, although these are rare. The TAMUK produces all of the major colors, such as blue and red.
2. Is there any reason to pass over or exclude a spotted/checkered rabbit or label it as "not a TAMUK" if all the TAMUK traits are present? The Dutch breed is included in developing the TAMUK Composite breed, so Dutch white-spotting is common. The Checkered Giant was never used. Of course, other breeds could be added later but there should be a clear breeding objective in doing so to improve the breed.

Enough said about that and I will never ask you anything about color/pattern again.

3. If you were asked to define the visible physiological traits that make TAMUK rabbits, regardless of breed, valuable as production rabbits. What would you tell them? **The ability to produce good litters year-round, even in hot-humid climates.**

4. Do you feel you were able to achieve an actual genetic adaptation with regards to those traits in the TAMUK breeds? **Yes. The expected high level of hybrid vigor is a bonus to ensure such genetic adaptation.**

5. Do you feel that all TAMUK breeds were instilled with those same genetic adaptations? **I developed only one other breed (the Altex) and only one commercial line of the NZW. But yes, the outcrossing to other breeds and lines, and the avoidance of close matings that would deteriorate breeding vigor, was part of the plan in developing this breed and line.**

The TAMUK rabbit, especially composites, are increasing in popularity dramatically. Breeders now exist in some very northern climates of the US.

6. Do you foresee a reduction in the heat tolerance attributes in those being raised up north, or for that matter being raised in an air conditioned environment? **This is possible. Breeders say that if you don't use it, you can lose it, in terms of genes and/or genetic traits.**

7. If so how many generations do you think it would take before there is that effect? **This is not possible to predict.**

On the flip side and with the summer's getting hotter and hotter for longer,

8. Do you feel the TAMUK's will be able to adapt? **Yes, but only if selection efforts continue involving rabbits that produce the best under hot conditions.**

9. What do you feel back yard breeders can do or should be doing to aid in the adaptation process? **Continued selection as previously stated, but also avoiding inbreeding.**

I am a strong advocate of forage feeding, supplemental or completely. In our previous emails I had asked about studies concerning TAMUK Composites and you mentioned the only ones completed were those involving forage. You also mentioned no comparison was made between breeds used.

10. Even though there were no comparisons made did you personally see any anecdotal

impressions indicating differences in either forage intake or efficiency of feed use between the breeds? **It was not obviously clear. I would need to look at my articles again to be sure that no breed comparisons were made.**

Lastly, I am a firm believer that the heterogeneity of the TAMUK rabbits is one of their most desired aspects yet many seem to want to standardize one TAMUK breed or another and even get ARBA recognition.

11. Do you believe ARBA recognition is needed or warranted? And why? **Definitely not needed in my opinion. It is important again to maintain diversity within the breed by not selecting for uniformity in type, color, weight, etc. Different breeders can select and develop their TAMUK lines any way they wish, but ultimately these lines should be crossed to reinstate genetic variability.**

As always thank you so much for your time and I hope you don't mind if I reach out to you again sometime.

You are welcome Dan.

In that email and the next below I have underlined the responses I feel should be emphasized. Dr. Lukefahr did not.

In early July 2024 I reached out with several questions but most were about my interest in a specific project he was involved in and only a few breeding or selection questions were asked.

On Saturday, July 6, 2024 at 07:42:48 AM CDT, Steven Lukefahr wrote

In the previous email discussion in June you mention that when breeding TAMUK rabbits it is important to not select for type, color, weight, etc. in order to maintain genetic diversity and variability. Yet you also state in the old archived TAMUK website page longer bodies (body surface area), large ears and non dense fur aid in the heat tolerance capability. This is also mentioned by you in your case study of the Ghana Rabbit Project.

I don't believe I would say this. The most important doe trait is the steady production of good litters. Of course, this reflects underlying traits such as nest building, litter size and milking ability.

Ditto for bucks that are from dams that had steady production of good litters. I just wouldn't select a rabbit with poor type or light weight.

Note: the mistake in my wording within the first question was the reason for the first sentence of his reply. I should have been clear in that what he said was "Not select for uniformity in type".

With all that said should I applying any selection criteria/pressure for decreased fur density, increased ear length, or increased body surface area? Or should I only be concerned with production? To me they almost seem intrinsically linked.

Again, set culling levels. After you identify your best selection candidates, then cull those that do not conform for these other traits that you mention.

As I mentioned once before your Ghana Project intrigues me I guess because of the similarities I draw from it with respect to the TAMUK Composite. But I also see in the Haiti and other projects basically the same scheme. Out of all the projects you were involved in which was 1. your favorite

to be involved in 2. made the largest impact on the rabbits farmers of the area 3. made the largest impact on you? (IOW your greatest takeaway)

Probably my Cameroon project since I lived and worked there for two years. There would later be over 1,000 families raising rabbits. The breeding practice was to select rabbits from the most productive parents and to avoid inbreeding by farmer's exchanging unrelated bucks each year.

The most recent question set from August 6th, 2024.

I would like to ask just a few questions. These I will likely make public if that is ok with you.

Yes, that is fine.

Since there isn't much actual data published on the Composites did you happen to track their weights personally as you were developing them? If so do you recall what their typical average weaning weight, and market weights (age) were?

The reason is that for many years the Composite-bred rabbits (now called TAMUKs) were raised only in my backyard, solely for meat production. There were only a few years (2010's) where they were at TAMUK and were involved in growth and forage feeding experiments. I found two studies that we did at TAMUK that involved the Composite rabbits. In one study done in summer of 2011, Composites were compared to TAMUK NZW rabbits; however, there were no statistical differences for growth traits between the two breeds. The initial average weight per rabbit was taken at 8 weeks of age. The growth study lasted for 4 weeks. So the Final weight was at 12 weeks of age. These ages represent typical age of fryers that are found in the Lesser Developing Countries. Also, the study was conducted in the summer to represent the hot and humid tropical climates found in the Lesser Developing Countries. The Gross feed conversion trait is feed efficiency. "Pellets" was a commercial Purina diet. SP is sweet potato forage. The second study was published and is attached. This second study only involved Composite rabbits.

Below is the table: To be clear, the averages are combined for both breeds since there were no significant differences.

Average performances for diets for growth and feeding traits.

Trait	Pellets	SP+50% Pellets	Wilted SP		
Initial weight, g	1226	1203	1222		
ADG, g/d	26.5	19.1	15.4		
Final weight, g	2146	1875	1761		
Pellets consumption, g/d	96.9	48.2			
Forage consumption, g/d	-	17.5	26.5		
Gross feed conversion	3.88	3.75	4.26		

Also, did you see any change comparing from before crossing them with the TAMUK Commercial NZW Line and after the crossing?

In general, the TAMUK NZW line was heavier in body weights than TAMUK Composites. This is because small breeds were involved in the latter breed, such as Dutch and Havana.

How do you recall the Composites comparing in feed efficiency regardless of feed type (commercial vs forage)? Versus the NZW Line? Again, you've mentioned there wasn't an actual comparison done between them in the forage studies but I am just curious offhand was there any notable differences between them?

(actually there were) Refer to my response to your last question. Again, both breeds performed similarly, so No.

In the Rabbit Research Center's webpages it's mentioned that some Commercial breeders/farmers were getting Composite REW's after you began to sell them. Do you recall if any ever reached out to you and expressed any misgivings or were they all seeing good results comparable to the results seen in NZW Line?

No, I was not made aware of this, and would not think that a Composite rabbit being a REW would be a problem.

And with that said, was there any tell-tale signs one could point to and say that rabbit A. is a TAMUK REW Composite or that rabbit B. was a TAMUK NZW line? If so, do you mind saying what one should look for to tell the difference between the two?

No, again. Accurate pedigrees would be key here. Maybe down the road, even DNA tests.

If my Composite herd's does weren't producing and the only access I had was to a breeder with the NZW Line whose does were very productive would crossing them be a good option in your opinion?

Yes, you could cross to a good NZW line if this is necessary to boost production.

I had the SP Vine study in my files and was actually referencing it the other day. And btw, do you mind telling me if crossbreeds in the Mudunuru paper "PERFORMANCE OF GROWING RABBITS FED LABLAB PURPUREUS FORAGE WITH MOLASSES MINI-BLOCKS AND RESTRICTED COMMERCIAL PELLETS" were composites?

No, they were from my home and were what would later be called TAMUK Composites.

Ok, I think I understand now. They were from you but were not yet the fully developed composite breed you later took into the Rabbit Research Facility in 2013?

With that said do you mind telling me what year you feel you finalized the composite breed?

Correct. Roughly by 2015.