

The Missing Comparator: Industrial Pet Food Versus Raw Meaty Bones

Many comparisons, one absent control: the natural functional standard

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The charge

For decades, Mars and the wider industrial pet-food system have treated manufactured food as the control and required alternatives to prove themselves against it.

No published controlled lifetime comparison has been located between a representative Mars industrial diet and a foundational raw meaty bones feeding system measuring oral, systemic, behavioural, welfare and longevity outcomes.

The natural standard was not disproved. It was excluded from the decisive lifetime comparison. Processed food remained the baseline and therefore escaped the test that could expose it.

Executive assessment

Foundation Document 1 established the industrial substitution. This paper asks the next question: where is the direct comparison between the manufactured system and the natural feeding system it displaced? [1]

The literature contains many comparisons. Nutrient profiles are compared with tables. One industrial formulation is compared with another. A dry diet is compared with a dental diet. A commercial diet plus a manufactured chew is compared with the same diet without the chew. Raw bones are offered briefly as dental items. Commercial raw mixtures are compared with kibble for selected blood, faecal or metabolic measurements.

Those studies may answer narrow questions. They do not answer the foundational one. None located for this paper compares a representative Mars industrial diet with a diet founded on appropriately selected raw meaty bones and carcass material over the life course, with the mouth, body, behaviour, veterinary burden and environmental costs examined together.

A scientific field can be structurally biased without fabricating a single number. Select the industrial product as the control. Exclude the biologically relevant comparator. Measure an endpoint the product can improve. Publish the difference. The resulting paper may be technically accurate while the decisive question remains untouched.

The central methodological problem

The missing comparator is not an empty space at the edge of pet-food science. It is the shield protecting the industrial baseline.

1. The control group decides the case

A control is not neutral merely because it is familiar. If the control diet itself contributes to oral disease, chronic inflammation or behavioural deprivation, then a product that performs better than that control has shown only relative improvement within an unhealthy system.

A dental food may accumulate less plaque than an ordinary kibble. A manufactured chew may reduce calculus when added to a commercial ration. A therapeutic formula may alter a laboratory value. None of those results establishes that the underlying industrial feeding system is biologically suitable.

The methodological inversion

Industrial food, the innovation, is treated as innocent until critics prove harm. Natural feeding, the evolutionary standard, is treated as suspect until it proves safety against rules written around manufactured products.

This inversion transfers the burden from the promoter of the substitution to the animal, owner or dissenter. It also allows the industry to define success by incremental improvement over its own baseline.

2. What counts as the missing comparator?

The term “raw diet” is too broad to be scientifically useful. It can describe whole prey, butchered carcasses, raw meaty bones, boneless meat, finely minced commercial mixtures, BARF recipes, prey-model ratios, supplements or improvised home feeding. These systems are not functionally equivalent.

For this investigation, the foundational raw meaty bones comparator means a feeding system in which suitably selected raw meaty bones and carcass material form the dietary foundation. Food structure and oral work are indispensable. Gripping, ripping, tearing, gnawing and crunching are part of feeding, not optional dental add-ons. Raw Meaty Bones and Work Wonders distinguish substantial raw meaty bones from finely ground products, recreational bones, manufactured dental chews and prescription kibble. [4]

The comparator must preserve:

- substantial pieces of meat, connective tissue and bone requiring active oral processing;
- regular cleaning, massage and exercise of teeth, gums, jaws and associated tissues;
- the distinction between whole or large-piece food and finely minced commercial raw products;
- an appropriately varied carcass-based diet rather than an isolated bare bone or occasional recreational chew;
- assessment of the animal as an interacting biological system, not merely a container for nutrients.

What does not answer the question

A study of pathogen contamination in commercial raw mince is not a test of the Raw Meaty Bones proposition. A study of a bone offered for twelve days is not a lifetime feeding comparison. A study of blood chemistry after four months is not a whole-system verdict.

3. The evidence map: many studies, one missing question

The published record shows active research around the perimeter of the issue while leaving the centre largely untouched.

Regulatory adequacy

Nutrient profiles and prescribed feeding procedures may show that listed nutrients are present or that short-term maintenance criteria are met. They cannot establish equivalence to natural feeding, oral function, lifetime disease burden, welfare or environmental cost. [2]

Processed food versus processed food

Comparing a typical dry food with a specially formulated dental food may show a relative difference in plaque or gingivitis. It does not establish that either feeding system is biologically sound. Hill’s-affiliated studies illustrate this restricted comparison. [11-12]

Industrial diet plus a manufactured intervention

Comparing commercial food alone with the same food plus toothbrushing, a dental chew or another oral-care product can demonstrate an incremental product effect. It does not test whether natural food structure could prevent or reduce the underlying problem more effectively. Waltham studies have

examined toothbrushing, dental chews, plaque microbiota, malodour and product performance while dogs remained within commercial feeding regimens. [7-10]

Raw bone used as a short-term item

Raw bovine bones have removed substantial calculus within days in beagles. Later work examined injuries associated with autoclaved bones. These studies are directly relevant to mechanical food form and safety design, but they are not lifetime comparisons of complete feeding systems. [13-14]

Commercial raw formulations versus kibble

A 2021 cross-sectional study compared 28 client-owned dogs fed raw meat-based diets with 27 fed kibble for more than one year. A 2025 intervention compared energy-metabolism biomarkers in 46 dogs for a median of 4.5 months. Both may contribute useful information, but neither used the foundational raw meaty bones system, neither was a lifetime trial, and neither centred periodontal function. [15-16]

Feral versus domestic animals

Clarke and Cameron compared dental findings in 29 feral and 20 domestic cats. The published abstract reports significantly more calculus in domestic cats but no statistically significant difference in periodontal-disease prevalence. That observational result does not establish equivalence between natural and industrial feeding. A cat labelled “feral” is not automatically a naturally fed cat; provenance, age, lifetime feeding history and environmental exposure remain essential. [18]

Tom Lonsdale recalls that the work used prepared skulls said to originate in the Northern Territory; that scavenging around rubbish tips serving Aboriginal communities could not be excluded; that Mars supported Clarke’s BSAVA presentation; and that a question later arose concerning some or all of the illustrations. These recollections are not treated as established facts. They identify records requiring retrieval and verification.

The evidence map in one sentence

The field is not devoid of data. It is organised around questions, classifications and controls that leave the industrial premise intact.

4. Periodontal disease cannot be omitted

The mouth is the first organ of feeding. A comparison that measures nutrients, stools, weight or blood chemistry while neglecting teeth and gums is not a whole-animal comparison.

Harvey stated in 1993 that several studies showed dietary form to be much more important than nutritional content in controlling plaque accumulation and gingival inflammation in dogs. Pet Foods’ Insidious Consequences quotes him explaining that natural feeding requiring tearing and separation of swallowable pieces makes the teeth and gingival tissues largely self-cleaning. Raw Meaty Bones and Work Wonders carry the same functional account into the wider hypothesis and practical feeding guidance. [3-5]

The industrial literature itself repeatedly acknowledges that periodontal disease is common, painful and often underdiagnosed. Yet much research treats dental disease as a separate product opportunity: dental diets, chews, toothbrushes, additives, screening tools and professional procedures.

The question kept off the table

Did industrial food create or amplify the need for the dental product being tested?

A valid comparison must follow animals through the two high-gain developmental periods: eruption of the deciduous teeth and eruption of the permanent dentition. It must then assess adult periodontal

attrition, systemic inflammatory consequences, pain, treatment under anaesthesia, tooth loss and quality of life.

5. Withdrawal is not proof of the replacement

When an animal improves after leaving industrial food, two events have occurred: the former food was withdrawn and a replacement was introduced. The observed improvement cannot automatically be attributed to every component of the replacement system.

This matters because commercial raw promoters often add recipes, ratios, vegetables, supplements, mincing, courses and branded products. Industrial manufacturers add dental shapes, additives or therapeutic modifications. Without separate comparison groups, the observed benefit can be captured by whichever replacement system is being sold.

A rigorous design should distinguish at least:

- continued industrial feeding;
- withdrawal of industrial food without restoration of substantial oral work;
- commercial minced or formulated raw feeding;
- foundational raw meaty bones feeding with food structure preserved;
- industrial food plus a dental or therapeutic add-on.

The attribution rule

Without that separation, neither Mars nor a commercial raw promoter can legitimately claim the whole observed benefit.

6. The Harvey comparison: a practicable test that did not proceed

The public archive records five items of correspondence in 1993 between Tom Lonsdale and Professor Colin E. Harvey, then Professor of Surgery and Dentistry at the University of Pennsylvania. Harvey was a leading veterinary dental authority. He acknowledged Lonsdale's Pet Foods' Insidious Consequences lecture, which argued that standard trials used processed food in both test and control groups and thereby standardised error. [3,5]

The proposed project was titled "Effect of the Form of the Diet on the Development of Periodontal Disease in the Dog - A Long-Term Clinical Trial". It asked whether a natural diet could keep the mouth healthy, whether dry food was more effective than canned food, and whether processed foods differed from the natural diet. [5-6]

In correspondence revisited in 2021, Harvey described a broader lifetime design comprising commercial canned food, commercial dry kibble, dry food plus a daily dental chew, a raw-food group and, ideally, a dry-food group receiving daily toothbrushing. He explained that lifelong control, repeated dental scoring under sedation and periodic laboratory testing would make the project expensive. He also considered major pet-food companies the obvious potential funders but thought they would be unlikely to support a study hypothesised to show distant-organ disease and reduced lifespan. [6]

These comments document the funding and ethical difficulty as Harvey saw it. They do not establish that Mars or any other company prohibited the study. Nor do they establish that a protocol reached formal ethics or funding review. The comparison was scientifically imaginable and operationally described, but it did not proceed to a published lifetime trial.

Lonsdale recalls that the earlier discussion also contemplated a simple comparison within an established beagle colony, with a randomly selected pen receiving raw meaty bones and the larger colony remaining on its ordinary commercial ration. He recalls Hill's Science Diet as the baseline ration and understood Harvey's comments to allude to institutional pressure. Those details remain author recollection requiring confirmation from the complete institutional record. [19]

Recovered-document correction

Earlier versions described Brown and Park's original paper and the complete Borthwick report as awaiting retrieval. Both are now available and have been read in full. This edition supersedes those provisional statements.

Evidential status of the Harvey episode

- Established: the 1993 correspondence archive exists; Harvey recognised the importance of diet form and natural oral self-cleaning; a long-term comparison was described; no qualifying lifetime trial was published.
- Author recollection requiring confirmation: the randomly selected beagle pen, the size of the colony, Hill's Science Diet as the ordinary ration and institutional pressure as the reason the project failed.
- Not established: the identity or motive of any decision-maker; a formal prohibition; commercial instruction; destruction or suppression of results.

7. Recovered partial experiments sharpen the missing question

The recovered primary documents remove any suggestion that food form and natural oral function were unknowable or experimentally inaccessible.

Brown and Park, 1968

Twenty-six adult beagles maintained on moist food were given raw oxtails at weekly or fortnightly intervals. Established calculus was rapidly removed, weekly provision controlled reaccumulation, and the authors reported the feasibility of regular oxtail feeding for calculus control. This was a direct experiment in oral function. It was not a lifetime comparison of complete feeding systems. [17]

Borthwick for Waltham, circa 1986

The complete Waltham-commissioned report found that broad meat categories did not distinguish periodontal outcomes well, but regular access to bones, rawhide or very hard biscuits was associated with highly significantly lower periodontal, plaque and calculus indices. Borthwick concluded that modern feeding had not appeared to improve dental health, that increased mastication could greatly assist control, and that the prevailing veterinary approach was largely ineffective. He also recorded risks from uncontrolled bone use. The report supplied both a signal and the cautions needed for a properly designed trial. [20]

Watson for the Australian Veterinary Association, 1994

The AVA-commissioned review, later published in the Australian Veterinary Journal, described periodontal disease as a serious diet-related problem. It associated softer food with increased disease, preferred harder food requiring vigorous prehension and mastication, and recognised that nutritionally complete soft food could remain physically inadequate. Watson called for further comparative research. [21-22]

Lippert and Sapy, 2003

An observational longevity report categorised dogs by broadly described home-made, mixed and industrial feeding and reported a difference exceeding 32 months between the extreme categories. The study was not randomised, its categories were crude, products were unidentified and home-made food was not equivalent to foundational raw meaty bones. It is a population signal requiring independent replication, not proof of causation or Mars-specific harm. [23]

What the recovered evidence establishes

Food structure, mastication and baseline feeding deserve direct investigation. Long-duration observation and controlled oral-function experiments were feasible. Professional and corporate-affiliated researchers knew that nutrient adequacy did not settle physical adequacy.

What it does not establish

None of the recovered studies supplies the missing independently governed lifetime comparison between a representative Mars industrial diet and foundational raw meaty bones feeding. Partial evidence cannot be inflated into that answer - but neither can its limitations justify continued non-inquiry.

8. Why a Hill's episode belongs in a Mars investigation

The Harvey episode does not directly implicate Mars. It involves a different manufacturer and an academic institution. It belongs here because the missing comparator is protected by an ecosystem, not by a single brand.

Across the industrial pet-food field, the same architecture recurs:

- manufactured food is treated as the normal control;
- industry-linked institutions define fundable and publishable questions;
- natural feeding bears the burden of proof while the industrial innovation escapes it;
- research develops products to manage consequences without testing whether the baseline feeding system generated them;
- companies benefit collectively when the decisive comparison is absent.

Mars need not have blocked the Harvey study to benefit from the methodological settlement it illustrates. Waltham research comparing a Mars commercial diet plus a Mars oral-care intervention against the same commercial diet leaves the same foundational question unanswered.

The allegation is structural

The claim is not that every scientist falsified data. It is that the field was organised so that the industrial system could accumulate supportive fragments while the natural standard remained outside the frame.

9. The trial that should now be conducted

A defensible programme need not begin by creating a new lifelong laboratory colony. Existing colonies already maintained on industrial diets, client-owned animals and veterinary population data can be used without deliberately imposing additional exposure.

At minimum, the prospective comparison should include:

- a representative Mars industrial maintenance diet;
- the same industrial diet with the company's recommended dental intervention;
- a commercially minced raw formulation, to prevent raw products being conflated with RMB;
- a foundational raw meaty bones and carcass-based feeding system with food structure preserved.

The design should be independently governed, preregistered and published irrespective of outcome. Diet classification, deviations, adverse events and withdrawals must be transparent. Mars should provide funding without control over protocol, analysis, authorship or publication.

Outcome domains should include:

- deciduous and permanent tooth eruption, plaque, calculus, gingivitis, attachment loss, pain and tooth retention;
- oral and gut microbial ecology, salivation, chewing and swallowing;
- immune, inflammatory, metabolic, renal, hepatic, cardiovascular and musculoskeletal measures;
- behaviour, occupation, appetite, satiety and quality of life;
- medication, anaesthesia, dental procedures, veterinary attendance, owner costs and mortality;
- processing energy, packaging, transport, waste streams, faecal volume and other environmental burdens.

Lifetime follow-up remains essential

Interim results at months and years would not replace lifetime follow-up. They would make continued avoidance progressively less defensible.

10. Three explanations, all requiring disclosure

After decades of warnings and abundant resources, only three broad explanations remain:

1. **The decisive comparison was never seriously considered.** That calls into question the competence and objectivity of the scientific system.
2. **It was considered but could not obtain approval, funding or publication.** That requires examination of institutional, ethical and commercial influence.
3. **It was conducted wholly or partly but the results were not published.** That requires preservation and disclosure of the evidence and the decisions surrounding it.

None of the three permits business as usual

Claimed ignorance is not exoneration where a corporation and its professional allies possessed the means, warning signals and commercial incentive to know.

11. Records investigators should obtain

1. All Mars and Waltham protocols, datasets and reports comparing industrial diets with whole prey, carcasses, raw bones or raw meaty bones.
2. All discontinued, refused or unpublished projects involving food form, chewing, periodontal disease and whole-animal outcomes.
3. The full 1993 and 2021 Harvey-Lonsdale correspondence, proposed protocol, ethics records, funding records and internal University communications.
4. Records identifying the ordinary diet used in the University of Pennsylvania beagle colony and the number and disposition of animals available for the proposed comparison.
5. Brown and Park's original records, colony feeding histories, adverse-event records and follow-up studies.
6. The Borthwick commission, complete report, raw data, drafts, correspondence, internal reviews and all successor decisions.
7. Watson review drafts, AVA correspondence and the assistance supplied by Colin Harvey, Barbara Fougere and Stephen Coles together with any Mars or Uncle Ben's receipt, comment, circulation or response.
8. Mars research-governance documents explaining why dental chews and dental diets were studied without a foundational RMB comparator.
9. De-identified Mars veterinary and diagnostic data capable of comparing disease, treatment and owner-cost burdens by feeding system.

10. Communications showing who decided which comparators were acceptable, which endpoints were selected and which findings were submitted for publication.
11. All records relating to the Clarke-Cameron feral-cat study including specimen provenance, collection locations, age estimates, lifetime feeding histories, dietary-classification criteria and raw data; any Mars or Waltham funding, correspondence and travel support; the BSAVA programme and presentation materials; the illustrations used; and any correction, withdrawal, retraction or editorial correspondence.

12. Conclusion

The industrial pet-food literature is crowded with measurements and missing its most important comparison. Manufactured foods have been compared with other manufactured foods. Dental products have been tested against industrial diets without dental products. Raw bones have been studied briefly as chew items. Commercial raw formulas have been compared with kibble using restricted endpoints. The natural feeding system itself has not been placed beside a representative Mars industrial diet in a published controlled lifetime trial.

The Harvey episode shows that a practical comparison was contemplated. Brown and Park directly demonstrated calculus removal and control by oxtail feeding. Borthwick carried the issue into Waltham's commissioned research environment, and Watson carried it into an AVA-commissioned national professional review. The Clarke-Cameron paper shows how an observational label such as "feral" can be mistaken for a verified natural-feeding history.

Yet the field moved towards product refinement and secondary classifications, not examination of the industrial premise. The continuing absence can preserve the baseline, protect the market and manufacture plausible deniability.

The questions Mars and its institutional allies must answer

- Where is the direct comparison?
- If it was never conducted, why not?
- If it was proposed, what prevented it?
- If it was conducted, where are the protocol, data and results?

Evidential status

This paper is a public-interest analysis and starting point for investigation, not an adjudicated finding that Mars, Hill's, the University of Pennsylvania or any named person committed fraud, suppression or criminal conduct.

Publicly documented facts, published research, Tom Lonsdale's recollections and matters requiring compulsory disclosure are identified separately. The Clarke-related recollections concerning funding, travel, specimen context and illustrations are recorded as retrieval leads, not findings.

The statement that no qualifying publication has been located describes the searches and sources reviewed to 26 July 2026. It does not prove that no unpublished, confidential, misindexed or undiscovered study exists.

Search note

Searches reviewed PubMed-indexed literature and official FDA, Mars/Waltham and Raw Meaty Bones sources using combinations of dog, cat, raw meaty bones, raw bone, whole prey, carcass, kibble, processed pet food, periodontal, dental, feeding trial, lifetime, comparative and related terms. Studies were screened for comparator, food form, duration and outcome domains. The search was designed to locate the foundational comparison, not to provide a complete systematic review of every pet-food study.

References and source notes

References appear in order of first citation. Public links are embedded where available; historical scans are retained in the project exhibit bundle.

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2. US Food and Drug Administration, “Complete and Balanced Pet Food”, explaining the AAFCO nutrient-profile and feeding-trial routes. [Public source](#)
3. Lonsdale, T., Pet Foods’ Insidious Consequences, Massey University, 9 September 1993; includes the argument that processed food was used in both test and control groups and quotes Harvey on diet form. [Public source](#)
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Source correction note: this edition supersedes earlier references to Brown and Park’s original paper and the complete Borthwick report as awaiting retrieval.